GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES
ASYNCHRONOUS BEHAVIORAL SELF-ANALYSIS BASED ON IMPROVING THE QUALITY OF DISTANCE EDUCATION USING CONTENT MINING IN E-LEARNING TECHNOLOGIES

S.Senthil*[1] & Dr. M. Prabakaran[2]
*[1]Research Scholar of Bharathidasan University, Assistant Professor of Computer Science, Kamaraj College , Tuticorin, Tamil Nadu, India.
[2]Research Supervisor, Asst. Professor, Department of Computer Science, Government Arts College, Ariyalur, Tamil Nadu, India

ABSTRACT

Improving the learning process of the internet become the high part to the distance learners. Specifically, e-learning environment possess the web mining studies that are available in web logs provided by the education server .the user that to find the services to access based on our relational studies. Without point of selection to access the learning service become tedious to the learners. To overcome the asynchronous e-learning provide new variation platform in data mining to the distance learners.by concentrating the self-analysis of learners around distinguishing conduct interest learners of students. This paper presents anasynchronous behavioral self-analysis e-learning (ABSAL). It is more viable to utilize web mining systems in an e-learning condition by improving quality of distance education to the e-Learners in light of their route practices, web substance, performances, and profiles. This implies a customized course substance that is conveyed to e-Learners. The course educators set up the web substance in various formats and those subjects are distributed through the web website, and they can distinguish e-student's route design, and the webpage structure can be changed in a versatile way with relevant and helpful subjects to learn. In this system, web content mining and web use mining are utilized for looking for resources and for finding e-student's route designs. At that point, communication sifting and substance separating are being used to make customized proposals.

Keywords: content mining, web tutorial analysis, multimedia learning, behavioral analysis

I. INTRODUCTION

This leaning styles and condition depend on an extensive variety of innovations based on the learning methodologies and PC applications notwithstanding the Internet applications and coordinated effort instruments while to take learning. In such intelligent and community-oriented learning condition, students can get to the learning resources whenever andwherever distance learning systems provides the essential apparatuses to screen watch and learn the point of track students' performance. Digital clearing process delivers advancement process of service to the learners in modern educational environment utilizing thespecialized devices, for example, PCs, systems, mobile ,tabs and interactive media, for example, sound, video, picture and designs, look components and electronic libraries.ELearning enhance the remote based providence and contributions given to the students using e-learning management system. The advancement of the digital class room and student based service process system utilized the digital libraries to provide content to differentials.

Additionally, students can't have compelling learning appraisal about their learning. In the meantime, educators cannotstraightforwardly contact to gather information from learners,**it** creates to inconvenience of understandability of student precise and convenient information and direction of learning procedure can't be successfully provided by the service provider. In the proposed system the behavior and interest of student was analyzed, after a timeframe, the educational information are store in databases that are in libraries toaccess with acollective countless enrollment

data, scholarly scores, and other helpful data, which, in the event that they are not utilized, will be gigantic with personalization fact.
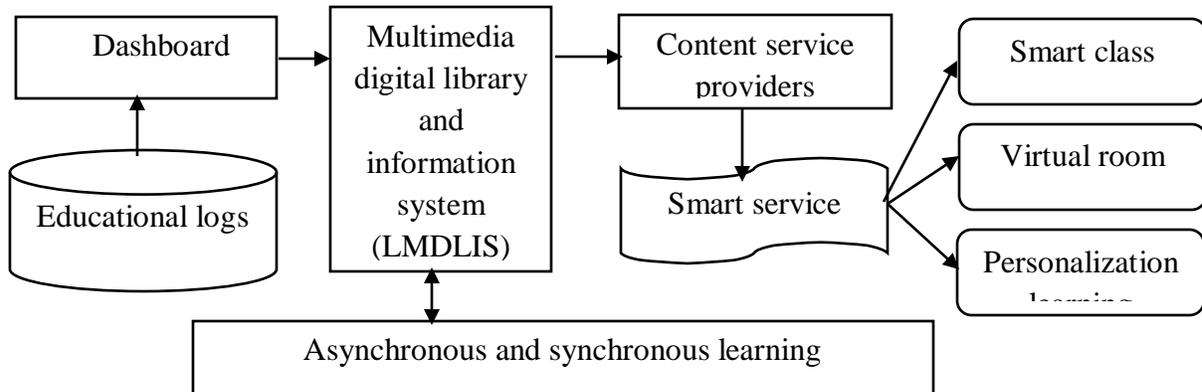

Figure 1 process of m-learning and e-learning system

The development of e-learning become a tremendous approach using various media like m-learning which it contains differential level of services. The most learning strategies are, virtual classes, smart class, multimedia learning and search teaching as shown in figure 1. Learning substances is frequently settled by self-governing and can't give customized learning material to clients become the problem. The above figure shows the process of asynchronous learning capabilities in e-Learning and m- education. It is exceptionally troublesome for teachers to get best resource to provide students learning and continue learningactivities by accessing the web materials,like Wikipedia,journals,and soon which they want to pick from online service providers. The great invention appeared on e-learning environment based on the web mining techniques.As of late, there is an ever-increasing number of inquiries about data mining on the web. Thelearners who access the specific topics to process or search the content from web mining the self-analysis begins the point of visited page. Alternatively the user specification based on continuous subsequent links followed to increase et he self-analysis relativity. Due to this mode of user access the web mining be utilized as a part of the proper administration, system change, webpage structure adjustment, quick services and information territories suggested.

Actualizing an effective e-learning system requires a productive building technique that consolidates all the necessary parts of an appropriate e-learning usage. This is because of the way that no single technology can meet every one of the necessities. Distributed system needs advancement in e-learning system for different point of interesting innovation to the students. The process of finding user oriented service give a better solution. The interest represented the self-analysis in appropriate sectors which the learners have to access the service.

II.   LITERATURE SURVEY

The learning system has various probability issues to provide learning services right to the learners. The problem was handled by different methods by various authors that review as given below.

Educational development application dashboards use the web mining resources for utilizing the student related activities to find interest to provide services [1]. Given its application potential. Web usage mining has seen a quick increment in intrigue. In the development of distance learning eLearning is the capable resource for the student with offline process of institutions, internet encouraging apparatuses are winding up increasingly vital [2]. Such mentoring devices enable students to hone at their own particular pace, furnishing them with legitimate clarifications and input when they commit errors.

Web server logs stores clickstream of educational data stored on web logs form predicting the related result. The information is put away because of user's entrance to a website [3]. Web utilization mining use of data mining can

be utilized to find user get to designs from weblog data. It reasons that there is solid confirmation that the personal attitudes of the populace, as opposed to unimportant school achievement, are conclusively identified with singular profit [4], to the circulation of salary, and to commercial development. The exhibitions of Web information recoveries and Web-based data warehousing are helped with relational web mining process to epredict the learner related studies to provide using electronic devices. Online learners mostly used one of the relational learning is web mining approaches in data mining [5]. Its consideration in dissecting users conduct on the web in the wake of investigating access logs made its prominence quickly, particularly in E-administrations regions.

An overview of relational analysis in the research need the necessary components to develop the eLearning students by utilizing the advance technologies. The service access based on the student capability of accessed resource[6], educator utilize the survey content of most needed search, e-Learning course quality, saw convenience, saw usability, and decent variety in evaluations are the basic components intimated to the students. An E-Learning system because of distributed computing is introduced [7], to be specific BlueSky cloud structure. Primarily, the engineering and center parts of the BlueSky cloud structure are presented.

The Cloud Computing condition ascends as a different stage to offer help to distance learning application frameworks also the management system uses the defaming analysisto permit and investigateinformation stored in databases. This producedservice of access from previous procedure to remove the necessary information [8] be access centralized.

Another measurement of these difficulties understands the way that an effective e-learning framework must arrange diverse mechanical, educational, social and social segments [9]. The most recent figuring worldview that is distributed computing can be outstanding amongst another method for processing innovation in advanced education and e-learning [11]. This portrays my anticipated design classicaltheory which has scholarly centralized service provide the possibility in distance learningfor administration development.

The private learning management provides various advantage to use the mining relation based on the interest by computing the subjects through online. This give the nonlinear administrations to the distance learners [12]. The use of cloud advancement in educational institutions to deal the capability of knowledge analysis in IT sectors to provide support to the distance learners.

Understanding e-learning viability is risky and challenged because of the extensive variety of contending needs and talks over the scope of education and preparing circumstances [13]. Associations which don't have preparing as their fundamental reason, however, depend on preparing to keep up a talented and skilled workforce have included troubles in determining the factors that reflect preparing viability because of the cooperation's of authoritative, innovative and learning elements.

At the point when the learning procedure progresses toward becoming automated, the information that are analyzed by mostly using data mining and distributed through media devices .the e-learning process which is for resource passed the educational mining approaches [14], distributed computing is set at a particular stage, as it can be progressively adjusted by showing an adaptable framework for the changing necessities of the PC assets after some time. It additionally facilitates the execution of data mining strategies to work in an appropriated situation [15], concerning the enormous databases created from e-learning.

This investigation uses a multimedia application that is appeared to an aggregate of 257 students. Early outcomes from the review and exchange tests demonstrate that students' contrasts assume a fundamental part in learning result [16]. Of course, the low earlier learning bunch scored altogether in the review tests when contrasted with the exchange test, and the high earlier information assemble performed relatively better in the exchange test. Learning and instructing has additionally experienced a change in perspective additionally progressing methods [17]. Today, educational process are conceivable obtain plenteous data in different domain with a tick of standalone process. As learning accomplices, one of the commitmentdoesn't exclusively to manage learners which will get domain assets.

There exist different strategies and applications in EDM which can take after both connected research destinations, for example, enhancing and upgrading learning quality[18], and besides unadulterated research targets, which tend to improve our comprehension of the learning procedure. In this investigation, we have examined different assignments and applications existing in the field of EDM and ordered them in light of their motivations. This assumes an essential part in upgrading learning forms by offering creative strategies for improvement and mix of more customized [19], versatile, and intelligent educational situations. Previous looks into works utilized the information knowledge learning system to restore earlier information using traditinl relational mining techniques [20]. Most of the previous methods are considered as keyword analysis compelling related to dynamic process stays too observe quite a while this related to the domain subjective.

III.IMPLEMENTATION OF PROPOSED METHODOLOGY

Nowadays e-Learning has turned out to be one of the social parts of the web, and it assumes a unique piece. Education Institutions, Universities, and Business Organizations utilize e-Learning system to disperse resources among e-Learners based on behavioral state. Those gatherings battle to give quality and valuable data required to e-Learners. Then again, e-Learners will be disappointed about the given data and lose center around e-Learning. With the previously mentioned issues, the accompanying cloud e-Learning system is created.
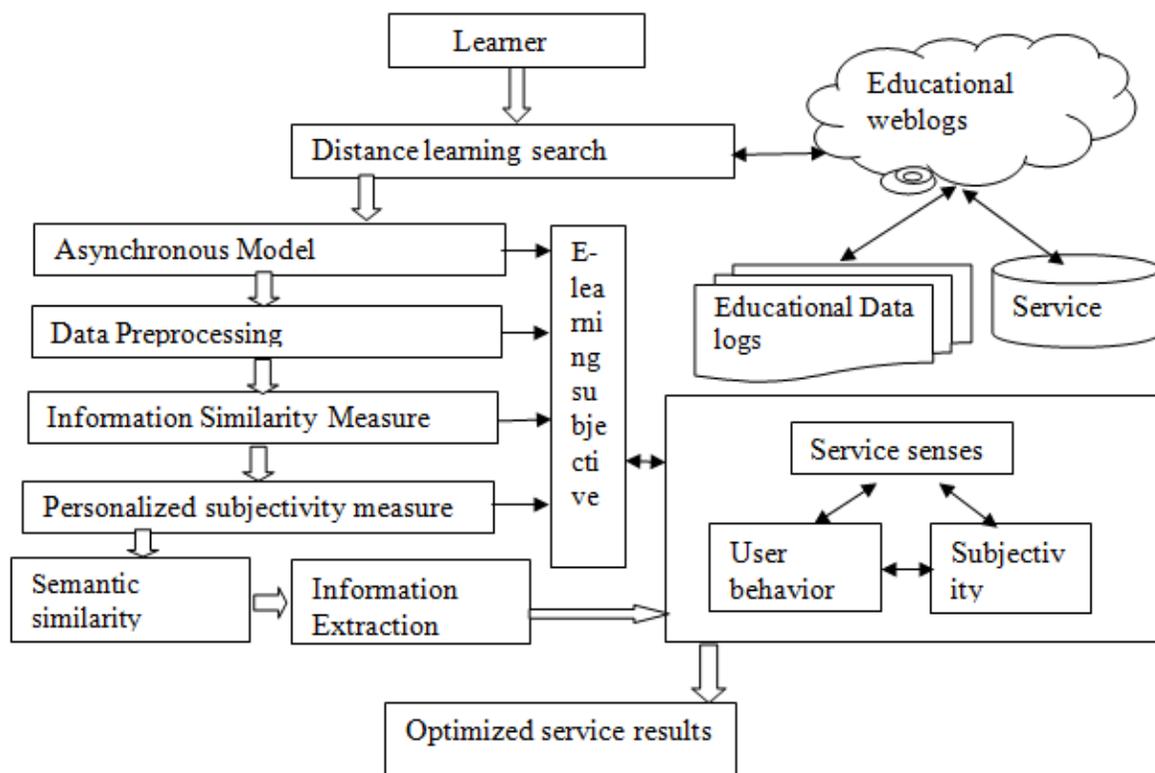

Figure 2 Implementation structure of proposed system

The capabilities of development and resource utilization is organized, figure 2 shows the implementation of asynchronous behavioral self-analysis based on educational mining relation to improve the possible education. The figure 2 show the implementation of proposed system. The subjectivity analysis is from E-Learning to assemble the student profile and gave countermeasures. Embracing the similitude calculation what's more, behavioral coefficient calculation, we composed a system model to clean and dive into the educational data and furthermore the students' learning mentality and the length of learning conduct to set up student profile. As per the E-Learning resources and

75

student practices, we additionally introduce the keen guide model self-behavioral analysis to direct both E-Learning stage and students to enhance learning things. The examination on student profile can supportive to distance Learning stage which meet current trends and guide the students' capability of distance learning conduct profoundly and additionally to give customized learning circumstance and advance the streamlining process of the E-Learning.

3.1 Leaning components
The following are the utilized learning parts processed in advanced learning technologies in the differential field of approach as follows,

Distance learning management: This segment gives a solitary sign-on entryway that offers an entire educational system enhance overall subjectivity and coordinated effort instruments understanding subjectivity. The additionally service intent a whole chain of command of open subjectivity the distinctive partners in the E-learning activity. The distance learning carries entryway speaks the subject passageway for learners, educators, learning education, distance management and guardians supportive with encounter the distance education.

Keen Classroom segment. Class room segments are Smart Classroom part goes for applying shrewd innovations in a physical and regular classroom. The venture overcomes any issues between present-day change - based and conventional classroom exercises as far as the educator's and student's encounters. All the more particularly, the segments of the keen classroom empower the instructor to use present-day innovation to improve the teaching background. Overall progress provide subjectivity exercises are preloaded to storeand facilitated to study on door for upcoming levels. Furthermore, innovated brilliant classrooms segment contains the educator be useful instrument carried to deal with the interest and motivate the learner subjectivity a remarkable spoke subjectivity knowledge. Defended brilliant classroom innovation transforms an ordinary classroom into a native UI for distance learner's period. Educators in the Smart Classroom can use various savvy parts technology to deal virtual classes are utilizing traditional training classes techniques to enhance the relative subject to students in a mixed strategy.

Conversation part. Developing goes for demonstrating every learner and educator different from workstation. Exchanging informationbetween the learners the PC material be the main instruments that learners are form institution where they can get to specific natural computerized substance enhance the educational module are important to carried.

Smart teach institutions. Development of learning system using advanced technologies savvy regarding giving full remote openness from distance learners, IP communication and online communication through virtual classroom. Specifically instance, learners be get to the passage utilizing their workstations through the remote system while the important,. It gives and builds up a major digital libraries logical and worldwide research databases. Furthermore, it gives an enormous library contains web resources teaching materials that are stored commonly

Subjectivity learning segment. Learners possess the essential difficulties face an effectively E-learning reception is the specialized aptitudes of the educators. Usually, while presenting another innovation in a customary setting condition, it is critical to survey the learning and abilities of the clients previously managing the new advancements. Assessing the preparation holds the necessity to specify theinstructor'ssupportive teachers is a crucial subjectivity related a fruitful usage of the distance learners venture.

Multimedia learning process. Real time subjectivity shows mindfulness is a critical to understand directly by relation. Mindfulness specify the multimedia smart crucial part in distance learners undertakings to the way that these ventures goals several parts of media that general public and manage conduct change. E-learning works specifically to present advanced learning techniques, aptitudes, and states of mind at teaching institutions, management, and distance learners.

3.2 Preparation queries using data preprocessing
The education directories contains learn documentsthat are storedweb resources to provide for coordinate data mining. They should be managed as needs be keeping in mind the end goal to have proper determining. Pre-

treatment process is isolated into four stages: data cleaning, client distinguishing proof, session recognizable evidence and was included. Based on the learner subjectivity the analysis the pattern revelation point to way for utilizing pertinent knowledge to calculate average access calculations to do exhuming specific subjects. The fundamental mining strategies used by web utilization mining incorporate measurable examination, affiliation rules, and successive examples, grouping, and bunching. KeywordPattern investigation is to exchange the guidelines, models, and insights found in the case of learning, at that point a critical model Customized benefit it will aggregate and group the client's entrance designs. Every client will be ordered into a classification as per its present model to get to the domain. In this class, the search query links suites picked using different self-analyzed learners be grouped powerfully accessed page links the learner to access by the learner. Therefore the customized administrations support to given as subjectivity relation. It can be utilized to discover the students' advantages and inclinations by mining the single student's perusing data to omit other non-relation from search.

3.3 connected learning components

The connected components are the relation among unstructured components of study material in administrations to create qualityto measure the subjectivity closeness. Web resources provide the valuable information to a superior plan of the web server, for example, page reserving, organize transmission, stack adjusting, and data conveyance. Likewise, data mining can likewise discover the unlawful connection of data information to organize, additional intent escape clauses, aware enhance placestudy performance.Site auxiliary adjustments.The relations are acceded out the way of behavioral state and interest to pull in students to study the subjects. Educational data Mining can give webpage change verification to the website originators by mining the students' route way and criticism,for instance the connections are related filed of search pages from web links most by the learners subjectivity. The home part specify the componential analysis of main subjectivity. By the page of links separated the interest if user learning for deep learning by the components that are relatively connected. This create the subjectivity connectivity among the pages where connected by learner search.

3.4 Behavioral learning analysis

Educational learning carries the advancement to provide quick access to the relational interesting study using behavioral analysis.in this stage the behavioral of each student is analyzed using interest score analysis by self-behavioral part. This can be well supportive to the distance education providers. Read the most search query from the learner which has th most relevant part from web documents. The service provided to extract the relational key terms mostly user have the behavior of search. The relevant terms are extracted to mean the average redundant list. The prediction list caries the interest score that re from the browse term learning capability. Finally the sort the query relevance score to rank h list of order to search text point whether point of evaluation repeatedly get the service to the learners.

Input: Edu-web service docs (WBS) dataset, optimized output service, query probing Qp.
Step1: initialize the most relevant list SL= {sl1,sl2….Sln}
    For (input query prepared most searched index terms←service optimality)
 Retrieve the behavioral self-analysis
Step2: Read learning most redundant Ls→service list {Sl1….}
      For (choose list query count!=Null as repeat service access)
        Service access list→ Ls ++;
 Step 3 computes the relational measure of a query term

$$Ls= \sum_s \frac{ubtotal\ number\ of\ service\ relates\ to\ query\ term\ (Qt)+correct\ query\ terms\ (Cq)}{total\ query\ term\ (Tq)}$$

Step 4 Extract the corresponding score to the order of most relevant search term
    Ls={Qls1,qls2..}
Step 5 Sort the score max rate Rls
Step 6 Return the query term service QTs=Rls(T) to search.
The above algorithm consider the multi attribute as service query term and user service access history to predict the e-learning service providence to perform the efficient service to the e-learners

3.5 Learning subjectivity analysis

The students' learning attitude makes a difference to the learning effect. The subjectivity analysis carried out by relational forms of maximum content accessed and statistically queries of obtained subjects are analyzed it, such as whether having the clear learning goal or not and whether having the learning plan or not. It reflects the learners' initiative by interest by deep substructure and recognition to E-Learning courses, which contributes to analyzing the interference factors of E-Learning on accessed results.

The steps are given below shows that

Input: learning docs, service list

Step 1: For each search $Si \rightarrow$ subjectivity analytics A(i)

Compute most case subjectivity access

Subjectivity learning SL Freq $= \dfrac{\sum Al(i).service == Si\ service\ analysis}{total\ services\ accesse\ +dterm\ repeated\ query}$

Step 2 Compute the subjectivity analysis.

$SA = \dfrac{\sum Al(i).service == Si}{total\ services\ accessed} * Sl(computed\ access\ weightage)$

Step 3 compute relevance weightage score

If SA> SC-Then subjectivity (service+ behavioral interest of user)

Service interest score {Sc1,Sc2…}

Step 4 Return term of access doc rank list $\rightarrow$ R(T)

End

End for.

The frequency of learning behavior reflects the attention of learners to the learning resources. According to the frequency statistics,the analyzed which course resources are more likely to be accepted by the learners most learners browse the text and make notes frequently; therefore the text resource is the most popular type of resources.

3.6 Personalized relational analysis

The educational service access using the relativity of content providers from personalized ranking in the most case learner'sinterest. In this process ofrelation analysis are from web logs which they are entered in server logs from educational web service. Specifically the interested search logs are behaviororiented, but in this personalized search recommends the maximum interest by content that are from visited page. Also theprevious visits have he mat terms interested subjectivity relational documents searched by the learner. The similarity measure carried the relational score among the key terms to be ranked y computing the behavioral weightage.

Input: Educational web service Docs (EWG), list of subject's availability Ls.

Output: Optimized behavioral based content.

Step 1: compute the service list SL

For each serviceSLfrom Sl {service list}

For each personalizedPDi from So

Subjectivity similarity measure query Q$\rightarrow$ sm

Step 2 Compute Number of relations it has.

Sm$\rightarrow$ Nearest query learning $= \sum$ Relations €Gi

Step 3: Computer Number of relative terms of access.

NIL $= \sum$ Links(Gi)<-$\sum$ Gk(Sgs)

Step 4: Compute the value of behavioral weightage.

ISM $= \sum$ subjectivity Concept(Links(Gi)) € Di

Compute the value of related subjectivity value.

RLS = = $\sum$ Concept(Links(Gi))) € $\sum$ Concept(Dj)!=Di

Compute behavioral weightageblw.

Max weightage measure (subjectivity score)

Add to weight set Ws $= \sum$ Ws(Di)+blw

Relativity analysis query q$\rightarrow$ t

Return subjective relational subjects

End

Above algorithm represents the personal access based on the information of specific subjectivity accessed by learners.

IV.RESULTS AND DISCUSSION:

The research familiarizes the educational learning system with proof of behavioral based learning capabilities to improve the education system. The test case results proofs are attained with behavioral analysis accuracy, time complexity, and false repentance with specified sensitivity and specificity measure of search logs from learners. Differential methods are evaluated for its performance in various conditions. The detail of the implementation is given below:

Table4.1: Parameter Details of Proposed Methods.

Parameter	Value
Framework	Microsoft Visual Studio Framework
Programming Language	C#.net, java scripting
Attributes considered	The time factor, search term, activity,
Number of users	1500 learners

The framework of development and parameters values are shown in table 4.1 to provide effective e-learning service in distance learning management the trained web contents are tested with 500 logs of learners with differential services. The implementation are projected in Microsoft visual studio development of framework, and the search servicequery based on the learner behavioral approach has been implemented using c# .net and the efficiency of the method has been analyzed. The proposed plan has obtained tremendous performance with quality of service be tested with dissimilar methods.

The service availability is the parameter which represents how efficient the behavioral terms is assigned on requesting to accept the e-learning service. It is compromised to test on differential search request that proceed and how many times specific self-search on related behavioral key term has been assigned.

Behavioral accuracy $= \frac{Number\ of\ behaviorally\ oriented\ queries\ the\ Assigned}{Total\ number\ of\ request\ received} \times 100$

The proposed local similarity measure based relational search of term queries from learners behavioral point of key term search model was projected to test in variation point to find the efficiency. The projected framework of implementation obtain the best performance of quality to the behavioral analysis.
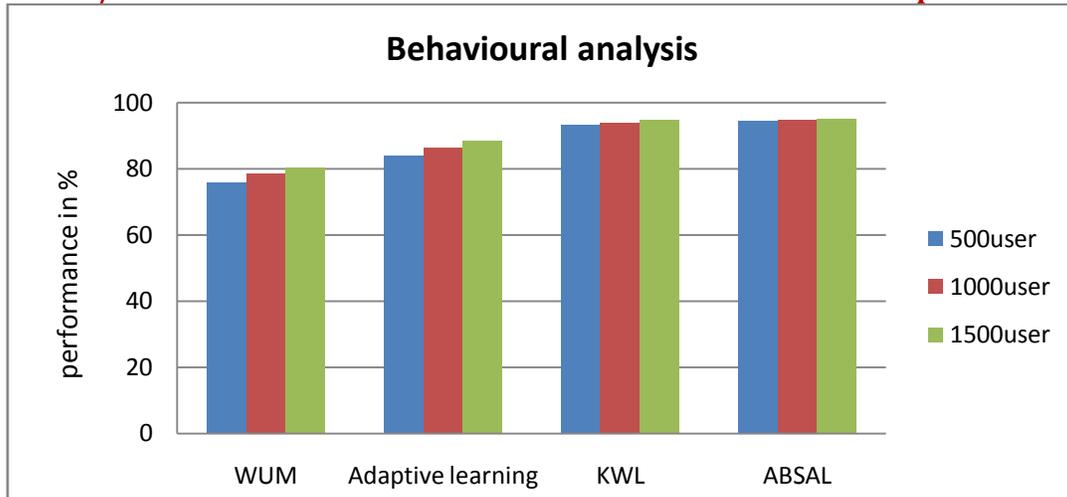
Figure 4.1: Comparison of behavioral accuracy

The above figure 4.1shows the variation user logs tested with differential service of behavioral analysis with search logs. The proposed framework resultant proves the performance has great impact of relativity from learner subjectivity. Our proposal enhance the resultant evaluated to compare with other dissimilar methods

Table 4.2 Analysis of behavioral accuracy

Methods /users	Analysis of behavioral accuracy in %			
	WUM	Adaptive learning	KWL	ABSAL
500	76.2	84.3	93.2	94.6
1000	78.6	86.2	94.1	95.2
1500	80.4	88.3	94.7	95.8

The above table 4.2 shows the behavioral analysis accuracy produced by WUMhas 76.2 % followed test case adaptive learning 84.3 %, knowledge learning 93.2% comparative result. The resultant of proposed system proves the higher efficiency 94.6% compared to other methods.

Impact of False analysis
The false analysis analyses unclassified behavioral providence which in irrelevant subjectivity to the e-learners that are calculated by,

False analysis measure FM $= \frac{Number\ of\ behaviors\ wrongly\ assigned}{Total\ number\ of\ queries} \times 100$
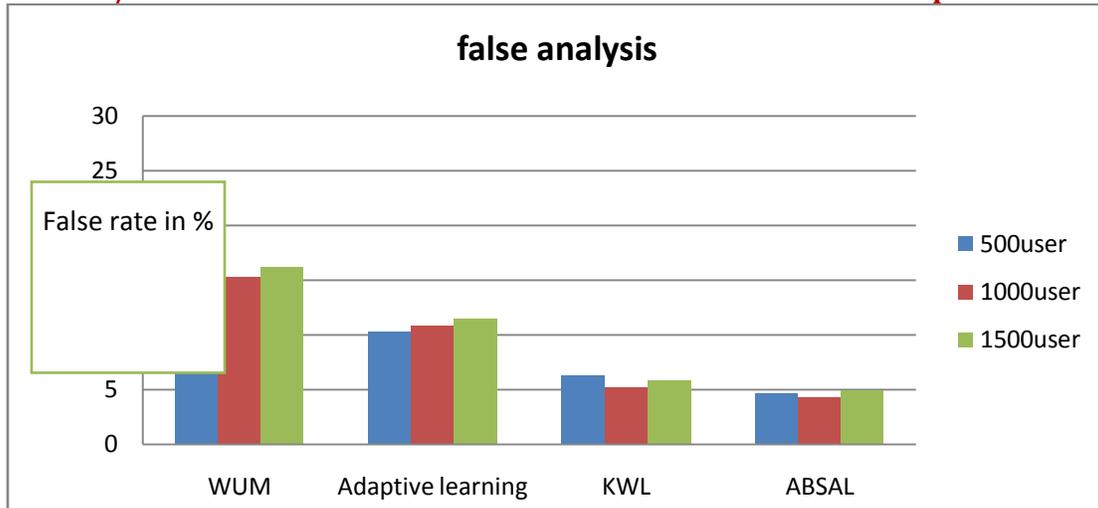
Figure 4.2: Comparison of False accuracy

The above figure4.2 reviews the non-related behavioral process of false relation. The projected idea implementation deals the redundancy of false analysis with improve the performance of self-analysis to reduce the false rate.

Table 4.3 analysis of false accuracy

Methods /users	Analysis of false accuracy in %			
	WUM	Adaptive learning	KWL	ABSAL
500	14.2	10.3	6.3	4.6
1000	15.3	10.8	6.7	5.2
1500	16.2	11.4	6.9	5.4

The above table 4.3 shows the behavioral analysis accuracy of redundant false rate produced by dissimilar test cases WUM 14.2 followed by adaptive learning process 10.3 ,KWL 6.3 compared with proposed implementation has great impact of 4.6 % best performance.

Impact of Time Complexity
Time complexity is analyzed to calculate the total number of time taken to execute service providence from the cloud environment to E-learners that are calculated by,

Time complexity Ts $= \frac{Number\ of\ behavioral\ oriented\ relational\ instance}{time\ taken\ for\ the\ Total\ number\ of\ request\ receive\ d} \times 100$
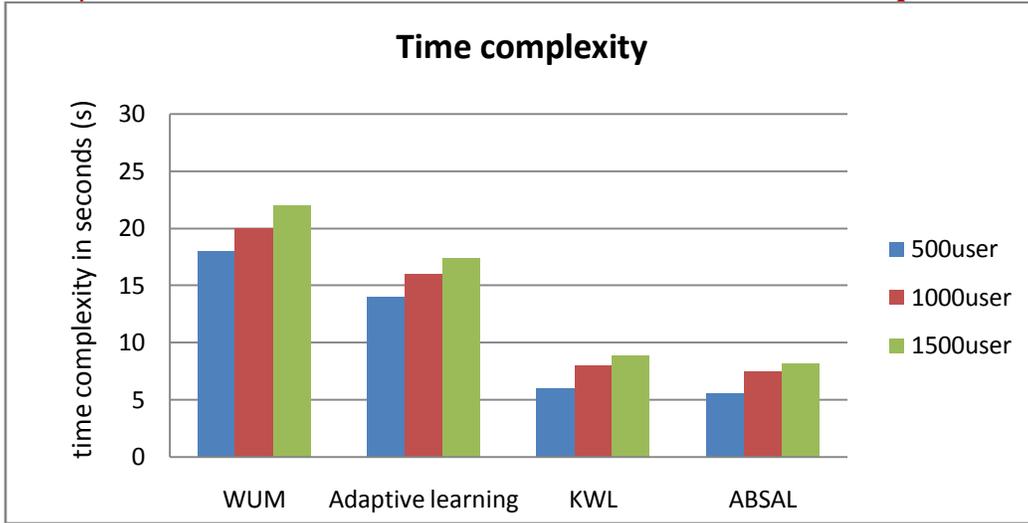
Figure 4.3: Comparison of Time Complexity of different methods.

The above figure 4.3, shows the execution of time relevant process by computing self-analysis time taken to analyses the behavioral process on differential users. The proposed system deals the problems in time of resemble to reduce the execution well compared to other methods.

Table 4.4 Analysis of time complexity

Methods /users	Analysis of time complexity(seconds s)			
	WUM	Adaptive learning	KWL	ABSAL
500	14.3	11.2	7.6	5.6
1000	15.2	12.3	7.9	6.7
1500	16.1	12.8	8.2	7.2

The above table 4.4 shows the behavioral analysis accuracy produced by time of execution in lower mean time to analyses the overall process. The proposed system improves the time of access level in short redundant complex states that other methods

V.CONCLUSION

To improve the performance of e-Learning, different approaches have been proposed. First, the asynchronous behavioral self-analysis Model suggested, which performs user interactive service selection to enhance the efficiency of learning management system for e-learners. The propose implementation self-analysis the computational measure based on educational data mining. Based on the calculated service acceptance measure, the similar services are ranked. Finally, the user will be allowed to choose a behavioral based learning system and the user access the learning advancements. The performance of the behavioral analysis produce well improvement in higher efficiency95.3% with unnecessary complexity 5.6 seconds has improved education capability.

REFERENCES

1. *Jaideep Srivastava, Robert Cooley, Mukund Deshpande, Pang-Ning Tan (2000), Web Usage Mining: Discovery and Applications of Usage Patterns from Web Data (2000).SIGKDD Explorations, Vol. 1, Issue 2, 2000.*
2. *A. Merceron and K. Yacef, "A web-based tutoring tool with mining facilities to improve learning and teaching," in Proceedings of the 11th International Conference on Artificial Intelligence in Education. IOS Press, 2003, pp. 201–208*

3. F M Facca P L Lanzi "Mining's interesting knowledge from weblogs: a survey" Data & knowledge engineering 53 (2005)

4. E. Hanushek and L. Wobmann. The role of education quality in economic growth, 2007. World Bank Policy Research Working Paper 4122.

5. Jie wang, Xianqiang then, "Application of web usage mining in the construction of distance opening education website," 2008, vol Ouyang Yang, Zhu M i an o li an ng ." Effective eLearning Environment Personalization using Web Usage Mining Technology" Innovations in E-learning, Instruction Technology, Assessment, and Engineering Education. Springer Netherlands, 2007

6. Pei-Chen Sun and Ray J. Tsai and Glenn Finger and Yueh-Yang Chen and Downing Yeh. What drives An empirical investigation of the critical factors influencing learner satisfaction. In Computers and Education, 50(4):1183 - 1202, 2008.

7. Ouyang Yang, Zhu Miaoliang." Effective E-Learning Environment Personalization using Web Usage Mining Technology" Innovations in E-learning, Instruction Technology, Assessment, and Engineering Education. Springer Netherlands,2007, pp,311-315

8. Dong, B., Zheng, Q., Qiao, M., Shu, J., Yang, J.: Bluesky Cloud Framework: An Elearning Framework Embracing Cloud Computing. iN: Jaatun, M.G., ZHAO, G., RONG, C. (EDS.) Cloud Computing. lNCS, VOL. 5931, PP. 577–582. Springer, Heidelberg .2009.

9. S. AL-Sharhan, A. Al-hunaiyan, and H. Al-Sharrah. A new efficient blended e-learning model and framework for K12 and higher education: Design and implementation success factors. The 2010 Fifth International Conference on Digital Information Management (ICDIM), pages 465-471, 2010

10. R. Clark and R. Mayer," e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning." Pfeiffer; 3 edition, 2011.

11. Vishwakarma, A.K., Narayanan, A.E." E-Iearning as a Service: A New Era for Academic Cloud Approach". Recent Advances in Information Technology. IEEE, 2012.

12. Chandra, D.G.; Borah, M.D., "Cost-benefit analysis of cloud computing in education," Computing, Communication and Applications (ICCCA), 2012 International Conference on, vol., no., pp.1,6, 22-24 Feb. 2012.

13. Al-Sharan, S., Al-Hunaiyyan, A." Towards an Effective Integrated E-learning System: Implementation, Quality assurance, and Competency Models."Digital Information Management (ICDIM), international conference August 22-24, pp. 274–279, 2012.

14. NungkiSelviandro, ZainalArifinHasibuan, "Cloud-Based E-Learning: A Proposed Model and Benefits by Using E-Learning Based on Cloud Computing for Educational Institution," Springer, Information, and Communication Technology Lecture Notes in Computer Science Volume 7804, pp 192-201.2013.

15. S. Sivakumar and S. Venkataraman, "A user-intelligent adaptive learning model for learning management system using data mining and artificial intelligence," International Journal for Innovative Research in Science and Technology, vol. 1, no. 10, pp. 78–81, 2015.

16. R. M. Rias and H. B. Zaman, "Understanding the role of prior knowledge in a multimedia learning application," Australas. J. Educ. Technol., vol. 29, no. 4, pp. 537–548, 2013.

17. A. Kapoor, S. Kabra, and H. Dua, "Development, use and impact of e-learning based modules for teaching electronics: To undergraduate girl students: A case study," in IEEE International Conference on MOOC, Innovation and Technology in Education (MITE), Dec 2014, pp. 215– 218

18. S. L. Prabha and A. M. Shanavas, "Educational data mining applications," Operations Research and Applications: An International Journal, vol. 1, no. 1, pp. 23–29, 2014.

19. M. Vahdat, R. Ghio, L. Oneto, D. Anguita, M. Funk, and M. Rauterberg, "Advances in learning analytics and educational data mining," in In: European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning, 2015

20. MS Hasibuan, LE Nugroho,"Learning Style Model Detection Based on Prior Knowledge in E-learning System" Second Informatics and Computing conference (ICIC),2017