International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 12 | Dec 2018 www.irjet.net p-ISSN: 2395-0072

# Ontology based E-Learning System for undergraduate Students using FPN and HMM

**Upasana Ochani[1], Samruddhi Handore[2], Sneha jagadale[3], Sameera Prabhune[4]**

[1,2,3,4]*Student of BE Computer, Indira College of Engineering and Management, Pune, Maharashtra, India.*

---

**Abstract –** *E-learning is used for the distance learning. Which helps the learner to learn anything from anywhere, anytime. We are creating a system which provide the distance learning for students. For creating this system we are using Knn, Mini batch k-means and Fpn algorithm for easy access of content for particular subject and also, we are adding the test for each subject.*

***Key Words***: Personalize learning, Knn, Mini batch K means, FPN, Adaptive learning, etc.

## 1. INTRODUCTION

This document is Nowadays growing number of popularizations in the World Wide Web promotes e-learning via web. During e-learning the users can easily share, reuse, and organize the knowledge. E-learning is the process of learning anytime and anywhere with dynamically changing contents of any course using electronic method. In contrast with traditional teaching method of learning using scheduled classroom session and the course contents are static in nature. Many educational institutions and organizations are adopting e-learning. Information about e-learning in the web increases day by day. Year by year the number of accessing the users count is increased in billion, in 2014 it is $52 billion and in 2015 it is double the time increased. Figure 1 shows the popularity rising chart in e-learning. The keyword-based search method in e-learning system provides irrelevant information during many search processes. The goal of e-learning is to give the user of an e learning platform a pedagogical content customized according to user's requirement. The idea is to find the pedagogical objective most adapted to the learner's requirement because we can find a course with several pedagogical objectives suggested by a teacher.

### 1.1 FPN and HMM

FPN is nothing but the fuzzy Petri Nets, which is used to trace the performance of the students. The FPN works in two phase one is Place and another is Transaction. The place is nothing but the source content of the subject you learn and the Transaction is nothing but the content which is learned by the students. With the help of this algorithm we will let know that how much student learned and how much is remained. The basic working of FPN is shown in the fig.1.

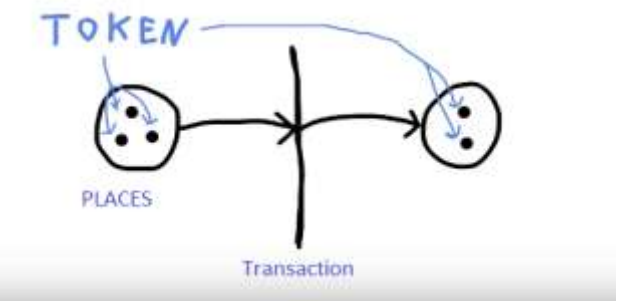


**Fig – 1:** FPN

In the above figure, as you see the tokens are nothing but the content of the subject and the paces is the whole subject.

FPN cannot support the variant adjustment of the leaning mechanism. So, follow the constantly changes of the learning mechanism we use HMM. To increase the level of the student we use this HMM algorithm. The level of the performance of student is mapped with the given criteria to get into next level we use this. By which we can increase the level of the student as per the performance of the student.

### 1.2 Mini Batched K-means

Mini Batched K-means is used to create the test for the appropriate subject section. With the help of this algorithm we create the test for each section and the test questions for each student are get shuffled to get the exact performance of the student. In this we create the batches of the questions which are get shuffled by taking test multiple times.

The fig. 2 shows the Mathematical expression of Mini Batched K-means.

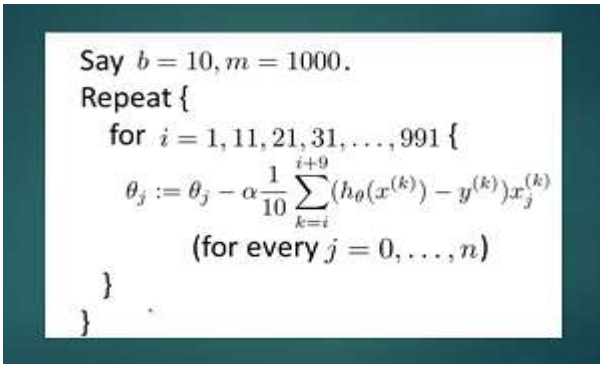


**Fig -2:** Mathematical Expression for Mini Batched K-means

## 2. PRAPOSED WORK

E-learning system is created in this way that the performance of the student is measured every day and the parents of the students can also go through the performance of the student. After each and every section of the subject. The performance of the student s calculated by the result of the test taken by the student and the activeness of the student on daily basis. The system is developed in such a way that it is divided into three entities student tutor and admin. The system should report the activities of tutors and student activities The figure 3 shows that learner gives pre-test then its LPS(Learning Path Sequence) is planned .Student's profile is developed based on pre-test .

Learning repository is formed using Ontology.

E-learning course content and it's tests are modeled using Petri Net with Fuzzy Rules (Fuzzy Petri net).HMM (Hidden Markov Model ) is used to find optimal Learning Path Sequence so that results which are obtained are optimal and according to the user profile.

The figure 3 shows user login, time that has been spent, and the amount of data user is accessing in the course. This system uses php, JavaScript, xml, CSS and html in coding. For the storage this system adds a few tables on the sql database. Role users involved in this system are the administrator, teacher, and student. When the user logs into the application of E-Learning, it adds new data into the database that contains the values to the time the user logging in. In addition to user login time data, this system also records users' activity in the course. Role of tutor/teacher is to design/edit the syllabus and upload to the system.

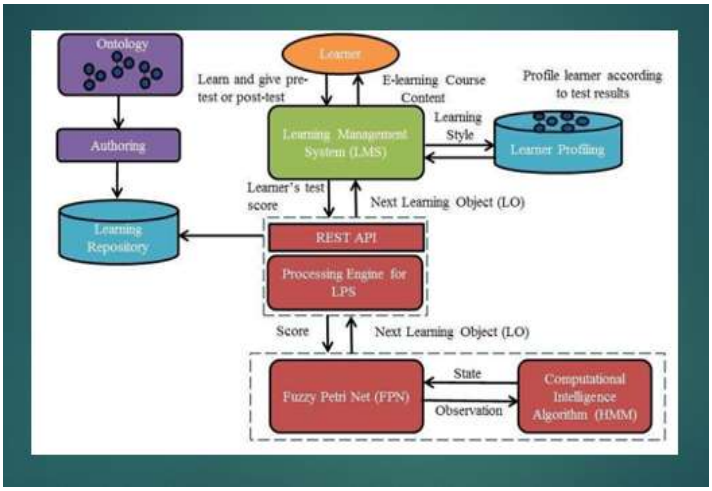


**Fig -3:** Architecture of E-learning System

Steps involved:

1. The learning objectives will be submitted by the teacher to expert/admin.

Admin will develop the assessments accordingly.

2. Now database will be manipulated accordingly.
3. This database will be analyzed by the tutor.
4. Tutor will design the curriculum considering difficulty parameters.
5. Now the user will view the required pdf and videos.
6. User will undertake the tests.
7. Tests will be moderated by teacher and the teacher will submit the results to admin.

Now admin will post the results and that will be viewed by the student.

## 3. MOTIVATION

Distance Learning is a learning model that makes use the power of internet. Internet lays the foundation of making distance learning real. Autonomous learning is a style of learning that takes advantages of distance learning. However, this kind of learning requires reliable and valid monitoring system that provides easiness in managing the courses. Thus, it is demanding to have such a dependable e learning system to support distance learning.

## 4. CONCLUSION

This system can help administrators and lectures to obtain information about users' activity involved in eLearning. The student progress report is displayed in weekly format, making it easier for activity assessment. Features can be filtered by time spent, and no of times the course is accessed. Hence a system of E-learning based on a HMM and FPN , the concepts of information retrieval systems, by searching the pedagogical content that is optimal for a Learner based on his profile and a set of pedagogical objectives set by a teacher and with what level the learner must learn.

## ACKNOWLEDGEMENT

We are grateful to our internal guide Prof.Aparna Lavangade for his/her support and guidance throughout the course of our Project.

**REFERENCES**

1. Monika Rani, Ranjana Vyas and O. P. Vyas "OPAESFH: Ontology-based Personalized Adaptive E-learning system using FPN and HMM" Proc. of the 2017 IEEE Region 10 Conference (TENCON), Malaysia, November 5-8, 2017.

2. Ayush Sharma "A Proposed E-learning System Facilitating Recommendation Using Content Tagging and Student Learning Styles" IEEE 978-1-5386-19223/17/2017 .

3. Vishal Pant, ShivanshBhasin , Subhi Jain "Self-Learning system for personalized E-learning".

4. Dr. S. Suguna, V. Sundaravadivelu, B. Gomathi, "A novel semantic approach in E-learning Information Retrieval System" 2nd IEEE International Conference on Engineering and Technology (ICETECH), 17th & 18th March 2016.

5. M. Suryani and Z. A. Hasibuan "The Study of Dynamic Delivery Adaptive Learning Content in E-learning Personalization Using Text Mining and Ontology Approach" ISBN: 978-979-1421-19-5 /13/2013 IEEE.

6. Nidhi Pandey, Ajay Kumar " Learning Algorithm for Intelligent Based E-Learning System" 978-1-4673-4529-3/12/$31.00 c 2012 IEEE.

7. Elena Madalina Jianu, Andrei Vasilateanu " Designing of E learning system using adaptivity and gamification " 978-1-5386-3403-5/17/$31.00 ©2017 IEEE.