

Survey of E-Learning: Content Personalization

B.Yogesh Babu¹, G.V. Sriramakrishnan², G.Visvanathan³

Department of Computer Science and Engineering, IFET College of Engineering, Villupuram, India^{1,3}

Associate Professor, Department of Computer Science and Engineering, IFET College of Engg., Villupuram, India²

Abstract: Data Mining is a process of identifying hidden patterns and relationship within data that can help for decision making. E-learning is a technology which supports teaching and learning using a computer web technology. The main aim of the e-learning is to provide sufficient amount of content to the well know student’s profiles and preferences and also to specific the better content for each student. In this paper we proposed the comparison of techniques and algorithms which used in the system to improve the student knowledge level and academic progress, but the quality of e-learning service is low and so there is a lack of interaction among e-learners.

Keywords: Content Personalization, E-learning Planning, Learning Object, Intelligent E-Learning System, Educational technology.

I. INTRODUCTION

Data mining (DM) sometime called data or knowledge discovery in database (KDD) is a process of collecting, search through and analyzing a large amount of data from different perspectives, as to discover patterns or relations and summarizing it into useful information. Normally data mining involves collecting information from data stored in database. The KDD process categorize into following steps: Data selection, data transformation, data cleaning, Pattern searching (DM), finding presentation, finding Interpretation, finding evaluation.

The task of data mining, finding various kinds of methods and techniques are used to find the various kinds of patterns. Data mining classified into common classes of tasks: anomaly detection, association, clustering, classification, Regression, summarization, trend analysis. Data mining software programs are divided into following categories: Data mining suites, Business intelligence packages, Mathematical packages, Integration packages, Extensions, Data mining libraries, Specialties, Research, Solutions. Analyzing the different level of data mining Are: artificial neural network, genetic algorithms, decision tree, nearest neighbor method, rule induction, data visualization, Multivariate Statistical Process Control (MSPC), Analysis of Variance, Discriminate Analysis.

TABLE I
EVOLUTION OF DATA MINING

Evolutionary Step	Business Question	Enabling Technologies	Characteristics
Data Collection (1960s)	“What was my total revenue in the last five years?”	Computers, tapes, disks	Retrospective, static data delivery
Data Access (1980s)	“What were unit sales in New England last March?”	RDBMS, SQL, ODBC	Retrospective, dynamic data delivery at record level
Data Warehousing & Decision Support	“What were unit sales in New England last	On-line analytic processing (OLAP), multidimensional	Retrospective, dynamic data delivery at multiple levels

(1990s)	March? Drill down to Boston.”	databases, data warehouses	
Data Mining (Emerged)	“What’s likely to happen to Boston unit sales next month?”	Advanced algorithms, multiprocessor computers, massive databases	Prospective, proactive information delivery

II. THE ROLE OF E-LEARNING

E-learning is a delivery of learning, training or education programs by electronic means. It involves the use of a computer or electronic device in some way to provide training, educational or learning material. E-learning is the use of technology and services to deliver curricula and to facilitate learning. Delivering education in e-Learning is a tool used within each point of the education process and powerfully coordinates the organization. The following seven great reasons to use e-learning are: Scalable/Efficient and Fast, Capacity and consistency, Higher Learning Retention than traditional learning, E-learning saves you time and money, Measuring learning activity and proving return on investment, Reduce your carbon footprint, Flexibility and finding hard to reach people.

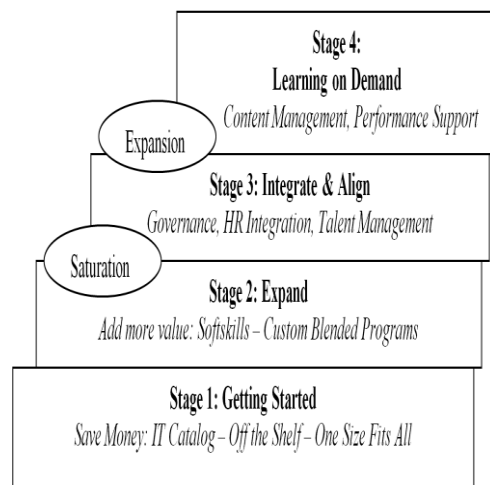


Figure 1: The Stages of E-learning

The main advantage of e-Learning is the use of technology to enable people to learn anytime and anywhere. E-learning is more cost effective than traditional learning because less time and no travel expenses. The various types of e-learning are: means of communication, schedule, e-learning class structure, Technologies used. The fig2 proposes four scenarios for the future of e-learning development for educational institutions.

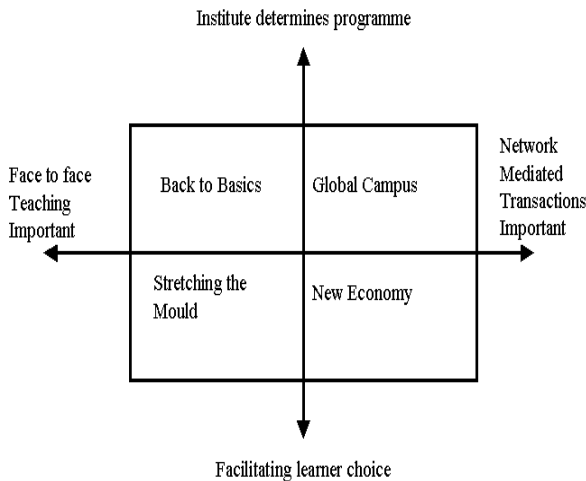


Figure 2: Future Development of E-learning

III.CONTENT PERSONALIZATION

A key requirement of the contemporary e-learning systems is the personalization that is a function able to adapt the e-learning content or services to the user profile. The personalization includes how to find and filter the learning information that fits the user preferences and needs.

A major aspect (and a great challenge at the same time) of instructional design and e-learning development is to know the behavior of learners. This way, an e-learning experience can be created that offers the most benefit for the learners and ensure that every component of the e-learning course is helping them to achieving their objectives and goals.

IV.LITERATURE SURVEY

Antonio Garrido and Lluvia Morales delivers a successful technique called myPTutor is a joint work to take advantage of Artificial Intelligence planning techniques in the adaptation of sequences of Learning Objects to pedagogical and students' requirements[1].

In Ivan Serina [5,6] prove that the imminent is a real valuable to increase the stability of the education course as well as to increase the performance and quality of the education routes.

The target is to facilitate instructor to prefer the most fitted education path and automatically adapt it in accordance with the students' desination and individual needs.

The primary target of intelligent e-learning environments is to improve students' learning process by giving more advanced educational techniques, so intelligent learning environments are based on different pedagogical eminent and theories that have been developed in the education field [2,3] Nedhal A. M. Al Saiyd, Intisar A. M. Al-Sayed and Shimaa Abd Elkader Abd Elaal , suggested the suitable architectural design for development modules of intelligent, personalized student focus and satisfied with the intelligent Web-based learning environment about the usefulness and efficiency.

It aids to improve students' to gain better knowledge level and academic progress.

Zbigniew Mrozek [4] A quality assurance system (QA) ought to check the necessitates are fulfilled. Likewise the value of essential certification plus learner perceptions, growth in educational faculty, and also improves efficiency of e-learning system. QA methodology ought to be measured along whole educational institutions.

Anna Katrina Dominguez, Kalina Yacef, James R. Curran [7] recovered Higher average mark attained from user who were allowed with pre-emptive hints to prevent future mistakes. And than those who were not and remained busy towards lengthier on the site.The use of data mining results shown that allow hints as division of the system loop is very effective. Intelligent systems on very much less of the time and cost expenses related with traditional ITSS.

Cristina Carmona, Gladys Castillo, Eva Millán [8] introduced an adaptive learning user model directed at finding out the student's preferences about the educational materials finish time, such model is really fit in e-learning systems that require to "filter" the large intensities of information available, and so users can make a better use of it.

Futhurover, the model is also capable to adjust itself to alters in the student's preferences. Silvia Rita Viola [9] suggested the approaches used for learners' profiles characterization. knowing the value of the learning scheme used by learners in Learners' profiles characterization in both the side with respect to distinct ways of non linear navigation. data driven approaches are useful for learners' profile, and that their employment can be advantageous for improving personalization of learning environments.

V. SURVEY TABLE

PAPER NAME	YEAR	EXISTING	DISADVANTAGE	PROPOSE	ADVANTAGE	TECHNIQUE	ALGORITHMS
E-Learning and Intelligent planning: Improving Content Personalization	Feb 2014	1.Adjacency Matrices 2.Integer Programming Constraints Satisfaction Models 3.Neural Network 4.Soft Computing Methods	To Monitor and Adapt the learning object of each learning route against unexpected contingencies	The myPTutor approach	The planning Techniques helps to bridge the gap between the e-learning necessities and the student Content Adaptation	Case-Based Planning Technique	-
A Generic Model of student-based Adaptive Intelligent Web-Based learning Environment	July 2013	“One Size-Fits All”	Low Quality of e-learning Service	Personalized search engine	1.Improve the Quality of e-learning Service 2.To Achieve the Student learning goals effectively	Intelligent e-learning System	Inherited Adaptive Object-Oriented Structure of the Course Material
E-Learning Using Data Mining	2013	Educational Data Mining (EDM)	Lack of Interest in Education Data Mining System	Data Mining in E-learning	1.Improve incorporate the learning task 2.Successfully incorporate to e-learning environment	Visualization Technique	-
Quality Assurance of e-learning Processes	June 2011	Numerous initiative have been developed on QA in Education	Low Quality of e-learning	QA Methodology	Increasing the Quality of e-learning	Quality Assurance	Grade Correspondence cluster analysis
Applying case-Based Planning to personalized e-learning	2011	AI Planning	Sequence of learning Objects (LO)	Approach to Automatically extract information from the LO	Allow the best learning routes for each student profile and course objectives	Case-Based plan Merging technique	Learning object Algorithm
Planning and Execution in personalized E-learning Setting	2011	Adjacency Matrices,Integer Programming Model, Neural Network and AI Planning	Execution of the learning routes, check its progress and act when discrepancies appears	Adaptation Approach (Plan Stability)	Reuse the original Route as much as possible and adapt /replan	LPG-ADAPT,LPG & SGPLAN6	-

Data Mining For Individualized Hints in e-learning	2010	Educational Data Mining (EDM)	Resulted in a high Drop out of Participants	Dynamically tailored hints for users	1. During the challenge in the form of hints and easier access to notes 2. hinting system were evaluated through a large scale participants	Cluster difficulty ranking	K-means algorithms
Discovering student preferences in e-learning	2007	“Filter” or “Sort”	Not paying too much attention to student preferences	Adaptive Machine learning system	User can make a better use of it	Stretch-Text techniques	IB algorithm
E-Learning Process Characterization using Data driven Approaches	2007	Electronic Learning Environment	Lack on Interaction of Learners	Learner’s Profile Characterization	Improving the Flexibility and Authenticity of the Learners and cost Benefits Ratio	Data driven Approach	Frequent Episode Discovery Algorithm(FED)

REFERENCES

- [1] Antonio Garrido And Lluvia Morales, “E-Learning And Intelligent Planning: Improving Content Personalization,” IEEE Revista Iberoamericande Technologies’ Del Aprendizaje, Vol.9, No.1, Feb.2014.
- [2] Nedhal A.M.AI Saiyd, And Intisar A.M.AI -Sayed , “A Generic Model Of Student-Based Adaptive Intelligent Web-Based Learning Environment, “Proceedings Of The World Congress On Engineering 2013 Vol II, WCE 2013, July 3-5, 2013, London, U.K.
- [3] Shimaa Abd Elkader Abd Elaal, “E-Learning Using Data Mining,” Chinese-Egyptian Research Journal Helwan University 2013.
- [4] Zbigniew Mrozek, “Quality Assurance Of E-Learning,” Presented On 22-Nd EAEEIE Annual Conference, EAEEIE 2011, Maribor, Slovenia, JUNE 13-15, 2011.
- [5] Antonio Garrido, Lluvia Morales And Ivan Serina, “APPLYING CASE-Base Planning To Personalize E-LEARNING, Proceedings/ Dms11/ DET/_Antonio_GARRIDO.PDF 2011.
- [6] L. Morales, A. Garrido, And I. Serina, “Planning And Execution In A Personalized E-Learning Setting,” In Advances In Artificial Intelligence (Lecture Notes In Computer Science). New York, NY, USA: Springer- Verlag, 2011, Pp. 232–242.
- [7] Anna Katrina Dominguez, Kalina Yacef, James R. “Data Mining For Individualized Hints In Elearning,” University Of Sydney, Australia 2010.
- [8] Cristina Carmona¹, Gladys Castillo² And Eva Millán. “Discovering Student Preferences In E-Learning,” International Workshop On Applying Data Mining In E-Learning (ADML’07) As Part Of The Second European Conference On Technology Enhanced Learning (EC-TEL07) 2007.
- [9] Silvia Rita Viola, “E-Learning Process Characterization Using Data Driven Approaches,” International Workshop On Applying Data Mining In E-Learning (ADML’07) As Part Of The Second European Conference On Technology Enhanced Learning (EC-TEL07) 2007.