Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 11, November -2017

KID Tutor
(Knowledge based Intelligent Database Tutor)

Weerasinghe V.C, De Silva M.F.A.E, Gajanayake H.G.V.U, BodaragamaL.C, N Vithana

Sri Lanka Institute Of Information Technology

Abstract: *Knowledge based Intelligent DB Tutor is an Intelligent Tutoring system that teaches conceptual database design using the Entity-Relationship data model. Most of the tutoring system offers only tutor's questions and are online help with freelancing teachers as their tutors. If a student wants to find an answer to their own question it is not possible with other Tutoring systems. Other systems use constraint based modelling has been used in a tutor that teaches a database language (SQL-Tutor) and a system that teaches punctuation and capitalization rules. In this paper we present an intelligent DB tutor which is capable of a reading user's problems and suggest Entities, relations and key of the question. After finding both entities and relations student can draw an ER diagram. KID tutor based on supervised learning. When analyzing the question the System will identify labeled text in question and suggest the Entities or attributes. After these process student can draw ER diagrams for particular question. Understanding and solving student's own problem is more helpful than practicing a common Questions.*

Keywords:*Intelligent Tutoring System (ITS), Knowledge Based, ER Modelling, Constraint based, Database Management System, Relational Modelling.*

I. INTRODUCTION

Knowledge based Intelligent Database Tutor (KID Tutor) is a computer system that aims to provide immediate and customized instruction or feedback to learners, usually without intervention from a human teacher. Those tutors are very helpful for students who are looking for self-study. The benefits of KID Tutors include personalized training, learning with real-world tasks, and multiple levels of help. Intelligent tutoring systems (ITSs) are computer programs that are designed to incorporate techniques from the AI community in order to provide tutors which know what they teach, who they teach and how to teach it, So that Student can easily interact with the tutor. These tutoring are used in various type of subjects and languages for instant mathematic, Computer science.

Objectives

- Students can enter their case study to the system
- Identifying the errors & how relations are selected
- Understand students' knowledge level & provide learning methods to student

Research population is all students who are learning IT in Sri Lankan Universities. Research Sample is Students who are learning IT in SLIIT Computing Faculty, Jayewardenepura University IT Students of Applied Sciences Faculty. Using Questionnaire to get Information from the student. The field learning ER-Modeling is quiet big field. Originally this field concerned about students and who are seeking learn about Database Management System, the field has expanded in to include the error checking in modeling tool and the identifying the relations of the ER diagrams, the entire development plan. The research group found the based on the statistical analysis results it can conclude as most 21 - 25 years old people who are studying Database. Gender does not affect the knowledge of the database Management Systems. Everyone are like to have an online tutor.

II. BACKGROUND

Kermit is an intelligent tutoring system that teaches the conceptual database design data using the entity relationship model data. The design of the database is an open task: although it is a result defined in abstract terms, there is no method used to find the result. Both systems have proved to be extremely effective in the evaluation in real classrooms. Kermit present experience in using Constraint-Based Modelling (CBM) in an open domain. Describe the architecture and functionality of the system. Kermit has also been evaluated in the context of authentic teaching activity. Present the results of an evaluation study with participants taking the conclusion of a database that show that Kermit is an effective system [1].
NORMIT: a Web-Enabled Tutor for Database Normalization describes the design and development of NORMIT an intelligent tutoring system (ITS) that teaches the normalization of the database to college students. NORMIT is a web-enabled system, and discuss their architecture and the techniques for the treatment of the students. NORMIT discuss the

constraint-based modeling (CBM), the underlying model student and the domain Approach. NORMIT is the first in the series of restriction-Tutor [2].

In DB-suite: Experiences with Three Intelligent, Web-based Database Tutors present with three intelligent tutorial systems based on the Web in the field of the databases.SQL tutor Teach SQL query language, NORMIT [2]is a data normalization tutor and KERMIT [1] Teaches conceptual database modeling with the entity-relationship data model. Three tutors in the DB-suite wereused in actual teaching and evaluated Activities. The main characteristics of these systems are presented and the evaluation Results. DB-private tutors have proven to be very effective in supporting deep learning, and gets along very well with the students. SQL-Tutor is most heavily developed constraint-based tutor [3].

SQL Learning Object Ontology for an Intelligent Tutoring System presents the development of learning object ontology for SQL contents. The learning object schema was designed by using the SCORM and the Ontology approach. The Learning objects can be used as an intelligent knowledge base Mentoring system. The main features of them are smaller Units of learning. These learning units are easier to retrieve, and share and reuse. In addition, it helps to define the different learning Strategies of the intelligent tutorial system at the performance of the system. The proposed ontology is Semantic search engine to measure performance [4].

Intelligent Tutor Recommender System for On-Line Educational Environments addresses the problem of improving the knowledge level of a student that uses an online educational environment by using algorithms for indexing and retrieval Mechanism and provides a method to present a per-use Procedures for more tutors Line. The main goal is, the most suitable partners, the pro- fissional help them. Restore is based on a user model Built by the experience of previous generations of students. The activities represent the raw input data derived from the in-formation Environment. The goal of Intelligent Tutor Recommender System for On-Line Educational Environments to provide developed a list of colleagues who are willing and able to provide help [5].

An ITS (Intelligent Tutoring System) is a system of complex and integrated software that applies the principles and methods of artificial intelligence (AI) to the problems and needs of teaching and learning. Allow at the level of students' knowledge and learning strategies to search, to increase or correct knowledge of students. Its aim is to respect the teaching and learning process in a selected area of knowledge and to improve the individuality of the students. In the document, an overview of intelligent tutorial systems (ITS) is presented in terms of their application and usability concepts of modern learning [6].

Large-Scale Deployment of Three Intelligent Web-based Database Tutors experience with the database location, a Web portal for students of university graduates in the courses of database. The portal was founded Addison-Wesley in January 2003. In addition to presenting Information about textbooks, the portal also offers Additional domain information, online testing and three intelligent tutorial systems developed by the intelligent Information Technology Group (ICTG) [7].

Adaptive and Intelligent Web-based Educational Systems is to create a systematic view of diversity, AIWBES and discuss the role and place of current research in AIWBES Area of Artificial Intelligence in Education (AI-Ed). It contains a brief description of the AIWBES technologies are classified according to their country of origin. Also try to distill the new one Design paradigm behind modern AIWBES and to compare it with a traditional design Paradigm that has dominated the field of AI-Ed for the past 15 years [8].

DB-TUTOR: An Intelligent Tutoring System Using a Troublemaker Companion include three agents: a teacher, a student, and a chaperone. These use the idea that social interaction has an impact on cognitive development. The basic is that students can learn from their mistakes and take advantage of the mistakes of the companion. The partner is sometimes asked for help, and sometimes as a disturbing element. The aim of the learning partner is to stimulate cooperation through competition and demonstration. This document describes the architecture of an intelligent tutorial system based on Double Test Learning (DTL) with two companions as co-students, where one is a disturbing element. A system called DB-tutor is proposed to teach databases for students in the third year of the graduate cycle. The DTL strategy carries out a co-pupil in the learning session that receives the same training as the human pupil. The idea of the DTL strategy which includes four phases, based on the students who benefited from the mistakes of the students' classmates [9].

Intelligent DB Tutor, which use to have a more efficient plan for future year by create Intelligent Tutoring System for database management. In the literature review, the team has discussed and searched about the existing deployed systems in the Intelligent Tutoring System around the world and related solutions and researches have been done and developed by using learning database management also the literature review has covered about the Intelligent Tutoring System and how to learning database management.

III. METHODOLOGY

Feasibility Study

System consider the development pattern of proposed research decided that the iterative waterfall model is suitable for the development of the system. In practice, defects are introduced during every phase of the software life cycle.

Requirements gathering and Analysis

The Requirement Analysis and Specification phase is to identify the exact requirements of the system and to document them properly. Therefore Research Group analyzed the main functionalities of the system and finalized requirements.

Design

After analyzing gathered requirements next step is to start the designing phase. Research Group have used the Microsoft Visio to draw some diagrams like, Activity Diagrams and Use Case Diagrams to get the idea about the Tutor. Research Group were implemented a Web application to the tutor. In prototype Research Group designed the User's case study analyzing part.

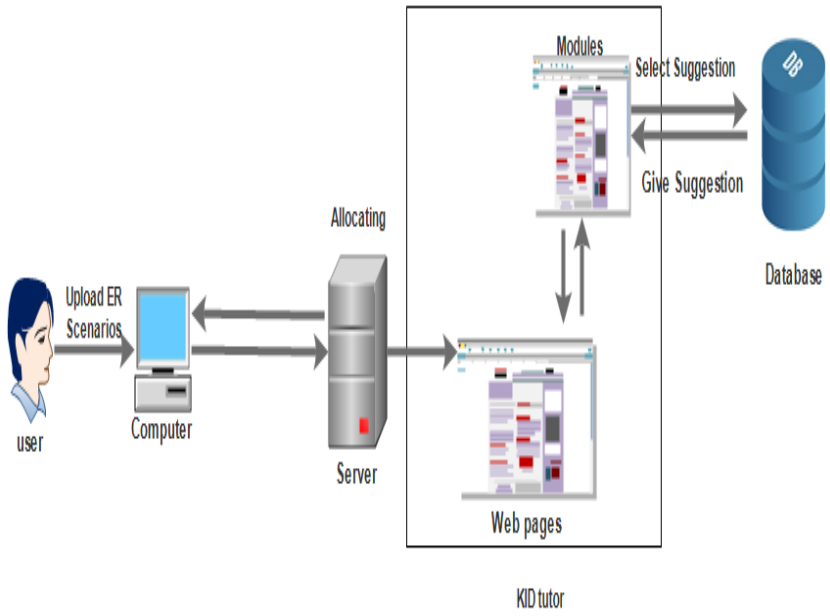

Figure 1: High Level

Figure 1. Illustrates the high-level architecture diagram of the system which teaches database ER modeling. The most significant point of this project, User can upload the case study of the problem and construct the ER diagram through the KID tutor. It's more advance than practicing same questions and it will help to solve user's real problems. There are some web sites which provide upload the problem to user but they solve through a human tutor and it will take some time. KID tutor is automated is solve the problem by just clicking.

Implementation

In this phase Research Group translated the software design into working system. Research Group used C# language MVC and konvaJS, JSON the programming language to program Knowledge based Intelligent Database Management Tutor.

Integration and Testing

During this phase Research Group integrated different modules in a well-planned manner. As a result, four group members had separate functions to develop, Integration is normally carried out through a three steps.

- Unit Testing
- Integration Testing
- System Testing

Research Group expected to do system testing to ensure that the developed system is working correctly. Finally planned to do acceptance testing to ensure that the all the functions satisfies with the system.

IV. RESULTS AND DISCUSSION

KID tutor is web-based tutor, which teaches Database Management Systems. It builds up with visual studio 2015 with ASP .net. The reason to choose visual studio as our IDE C# has main libraries for natural language processing.

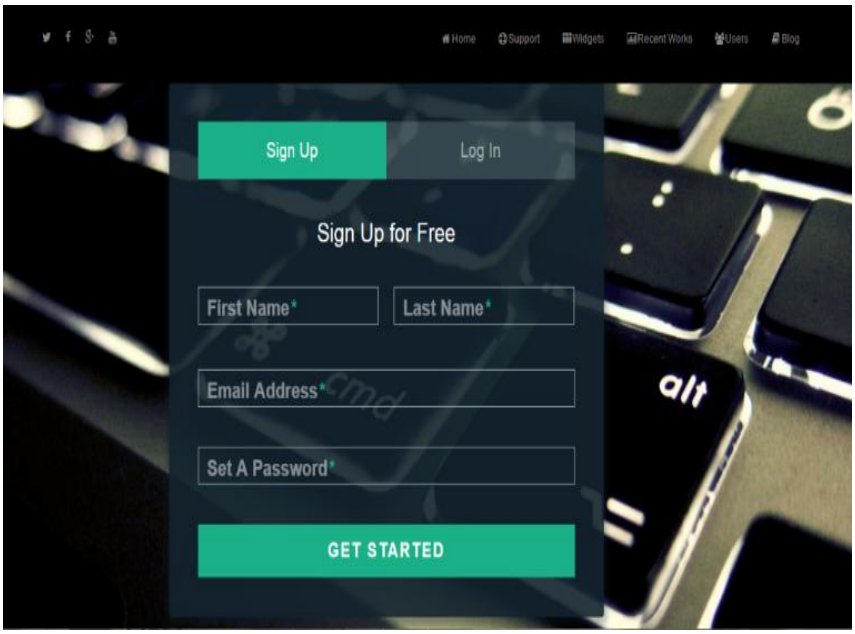

Figure 2: Login Interface

These all field are required, user have to fill this to sign up with the KID tutor. To complete the sign up Click on GET STARTED. And only registered students can login with the tutor email address and password required by the system and it also have to be verified user otherwise user cannot login. If password is forgot click on forgot password.

KID tutor are both sever side and client side. Case Study file uploading process are in client side.

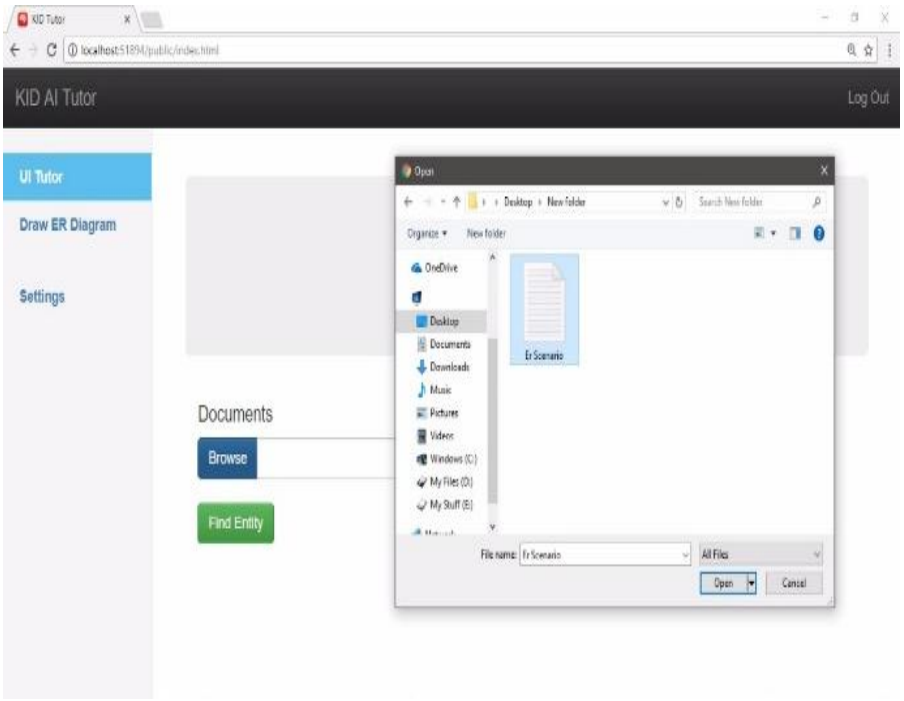

Figure 3: Upload Case Study Interface

By click browse button student can select file from the PC and just click on Upload file will upload automatically. After file uploaded, it will split in to word also we can say tokenization part. these are in sever side, using C# libraries first system found out what are the main Entities and Attributes and after Recognize what are relation for particular Entities.

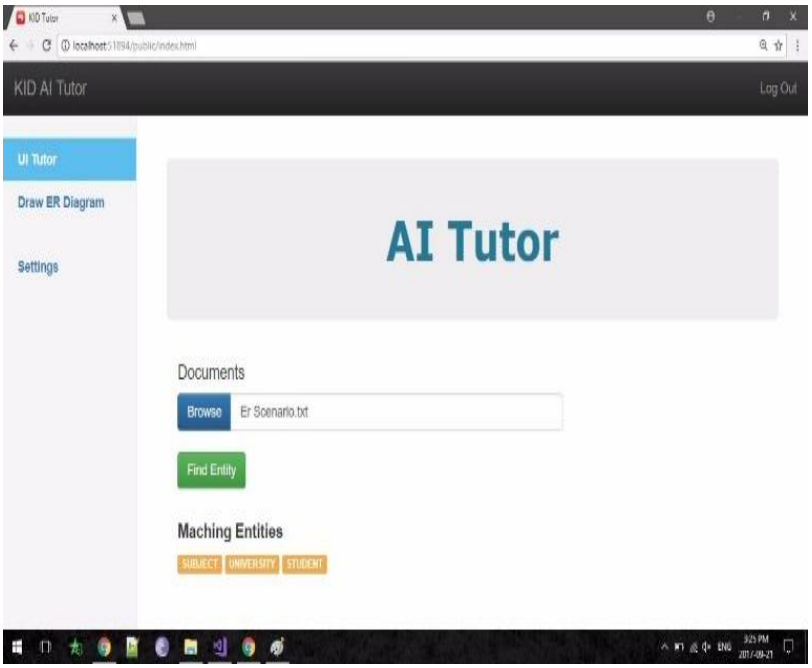

Figure 4:Split Entities & Attributes Interface

Then the data object will send to Drawing tool, using Json file when the object is sent, client can view Entity Attributes and Relations can draw the ER diagram.

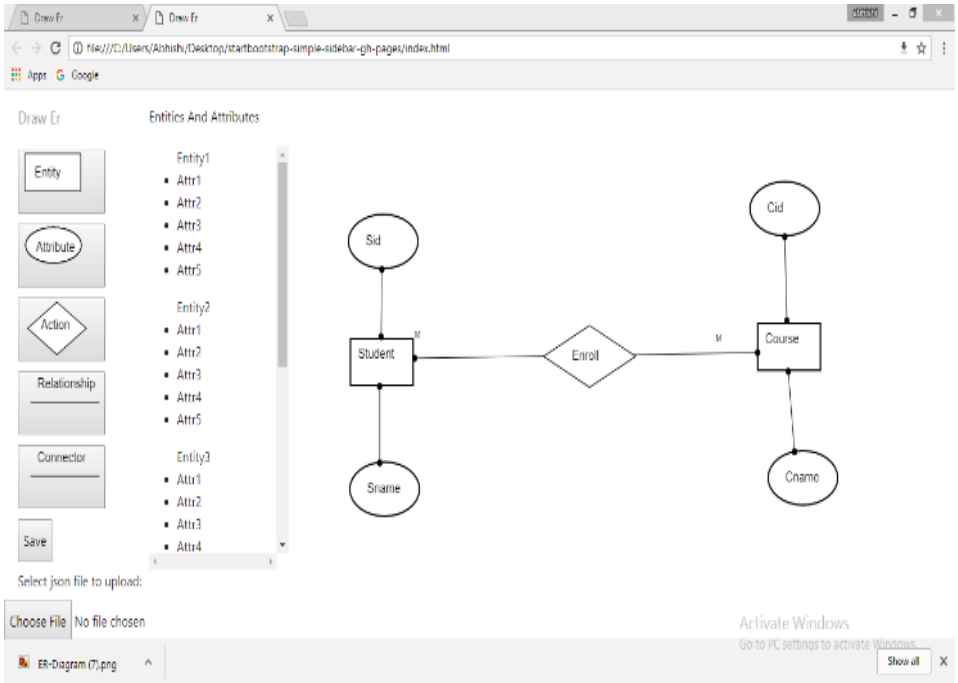

Figure 5: ER Drawing tool

ER drawing tool created on using konvaJS. Student enter the drawing tool he or she can see their Entities and Attributes for relevant uploaded case study. Then student can draw ER diagram. After drawing ER diagram by click save button student can save ER diagram as PNG file or JSON file.
In our system all checking and main process are doing in sever side rest of parts are doing in client side. After drawing part is finished student can check the answer student a human tutor KID have email gateway to send mails using the system. Using KID student can be better understand about DBMS subject.

V. DISCUSSION

"KID" tutor was developed to help students who are looking for self-study. The benefits of KIDs include personalized training, learning with real-world tasks, and multiple levels of help. During the developing period, the team had to face some technical and logical challenges. Following are some of the major challenges faced by the research group.

Build or adjusting algorithms to achieve accurate results.

Retrieving answers from logical questions.

Compatibility of the software tools used.

To avoid the listed problems, the team has to seek for support from other individuals who are working as Software Developers in the industry and to refer tutorials, researches, books etc. related to algorithm development.

VI. CONCLUSION

The application "KID Tutor" was developed with the main objective of provide immediate and customized instruction or feedback to learners, usually without intervention from a human teacher. KID Tutor are very helpful for students who are looking for self-study. The benefits of ITSs include personalized training, learning with real-world tasks, and multiple levels of help. Intelligent tutoring systems (ITSs) are computer programs that are designed to incorporate techniques from the AI community in order to provide tutors which know what they teach, who they teach and how to teach it, so that Student can easily interact with the tutor. In KID tutor, what trying to do is provide to student to upload text file to system by clicking. After system verified text file it also provides to student to highlight those Entities, Attribute and Relations it will check the knowledge level of student. After system will read case study and then categorize Entity, Attributes and Relations and suggest those element to user to construct ER diagram. The main intention of developing KID Tutor is to determine the students' knowledge of ER Modeling in Database Management System. As the main limitation in KID Tutor web application is the KID Tutor gives predictions only for select Entities, Attributes and Relations and student can draw ER diagram.

VII. FUTURE WORK

The recommendations for any parties who are interested in developing this system further are,

- The research group should make their users more aware of the web application and should provide guidelines for the users to help them with using this application accurately.
- The KID Tutor web application was worked any software platform because it was needed only an internet connection and web application. The latest web browser is mostly recommended for client side of the KID Tutor web application.
- For Google chrome web browser, the version 4.0.249 or latest version is recommended. For the Firefox browsers version 50.0.2 or latest version is recommended.
- When consider the server side,for the web server ASP.NET latest version and for the ERdrawing tool HTML Canvas was recommended to run this system.

References

[1] Pramuditha Suraweera, Antonija Mitrovic. 'KERMIT: a Constraint-based Tutor for Database Modeling', Computer Science Department, University of Canterbury Private Bag 4800, Christchurch, New Zealand, 2002.

[2] Antonija Mitrovic.'NORMIT: aWeb-Enabled Tutor for Database Normalization', Department of Computer Science, University of Canterbury Private Bag 4800, Christchurch, New Zealand,2002.

[3] Antonija Mitrovic, Pramuditha Suraweera, Brent Martin, Amali weerasinghe. 'DB-suite: Experiences with Three Intelligent, Web-based Database Tutors', Computer Science Department, University of Canterbury PrivateBag4800,Christchurch,NewZealand.

[4] Wilairat Yathongchai, Thara Angskun, and Jitimon Angskun. 'SQL Learning Object Ontology for an Intelligent Tutoring System',2013

[5] Marian Cristian Mihaescu, Paul Stefan Popescu, Costel Ionascu,'Intelligent Tutor Recommender System for On-Line Educational Environments', University of Craiova Department of Computer Science Craiova, Romania.2015.

[6] Predrag Dasic, Jovan Dasic, Bojan Crvenkovic, Veis Serifi.'A Review of Intelligent Tutoring System in E-learning', High Technical Machanical School of Professional Studies, Trstenik, 2016.

[7] Antonija Mitrovic and the ICTG team.'Large-Scale Deployment of Three Intelligent Web-based Database Tutors', Computer Science Department, University of Canterbury, Christchurch, New Zealand,2006.

[8] Peter Brusilovsky, Christoph Peylo.' Adaptive and Intelligent Web-based Educational Systems', School of Information Sciences, University of Pittsburgh, 135 North Bellefield Avenue, Pittsburgh, PA 15260, USA,2003.

[9] Tahar Bouhadada, Mohamed Tayeb Laskri 'DB-TUTOR:An Intelligent Tutoring System Using a Troublemaker Companion', Laboratoire de Recherche en Informatique (L.R.I) Faculty of Science Department of Computer Science University of Annaba,2001

[10] Arturas Kaklauskas , Ruslanas Ditkevicius & Leonarda Gargasaite 'Intelligent tutoring system for real estate management', Department of Construction Economics and Property Management, Vilnius Gediminas Technical University, Saulëtekio al. 11, LT-10223 Vilnius, Lithuania,2006.

[11] Mohanad M. Hilles,Samy S.Abu Naser 'Knowledge_based Intelligent Tutoring System for Teaching Mongo Database', Faculty of Engineering & Information Technology Al-Azhar University, Gaza, Palestine,2007.

[12] Andrew M. Olney.'GnuTutor: An Open Source Intelligent Tutoring System Based on AutoTutor', University of Memphis Memphis, Tennessee 38152, 2009.

[13] Mohammed A. Hamed, Samy S. Abu Naser.(2017) 'An intelligent tutoring system for teaching the 7 characteristics for living things', Department of Information Technology, Faculty of Engineering & Information Technology, Al-Azhar University, Gaza, Palestine,2017.

[14] Bing Liu, Wee Sun Lee, Philip S. Yu, Xiaoli Li 'Partially Supervised Classification of Text Documents', National University of Singapore, IBM T. J. Watson Research Center, New York, Yorktown Heights, NY 10598, USA.

[15] Imran Sarwar Bajwa, M.Abbas Choudha 'Natural language processing based automated system for UML diagrams generation', Computer and Emerging Sciences, Balochistan University of Information Technology and Management Sciences Quetta, Pakistan.

