USAGE OF CMS DATABASE & DBSCAN ALGORITHM IN THE MANAGEMENT OF LEARNING AND KNOWLEDGE ELECTRONIC AT APPLYING ON THE INSTITUTE OF QUALIFYING WOMEN TEACHERS

Anhar Khairy Al-deen
Department of MIS, Mosul University, Mosul, Iraq

ABSTRACT
The content management system plays a role in e-learning, therefore the paper took used of WP Database & SCORM cloud in building Content Management System used by lecturers/students to develop the skills and capabilities of students which enable us to build elearning Web site of Institute of Qualifying Women Teachers online. elearning Website enables students from knowledge-sharing to work together on a common subject online using chats, email and discussion forums The teacher's evaluation form is filled by the students and because of the sensitivity of the information and in order to ensure that information will not be changed the CRC algorithm has been used to store the results of the evaluation of teachers in the database without any changing. DBSCAN clustering algorithm has been used in order to cluster the student into groups by using students' data from the final year students database in the Institute of Qualifying Women Teachers through collected all available data including their performance examination in various subjects (Grammars, Literature, and Spelling)

KEYWORDS: *KM, Information Technology, CMS Database, WP Database, E-Learning, DBSCAN Algorithm, CRC*

I. INTRODUCTION

To keep pace with the development of Internet applications in education and in order to raise the level of performance of the students of Arabic language Department (for the students of today - the future teachers) and to make the educational and training process more interactive and enjoyable for the teacher and student or trainer and the trainee the modern technologies were used in the construction of an integrated system for the management of the educational process in whole or in part, via the Internet, This includes materials and courses management, the communication tools (synchronous and asynchronous), the management of tests and examinations, duties, registration in courses, assessment of the level of performance of the students, professors assessment and students' learning follow-up on three sides:
-System Management: Develop settings (preparations) and establishing the courses and distribution of authorities or roles.
-Teacher: set the content and tests, put up discussions, lectures broadcasting
-Student: read content, participate in activities, and view or attend lectures

II. RELATED WORK

Y. Vovides, S. Sanchez-Alonso, V. Mitropoulou, G. Nickmans in (2007), This position paper sets out to inform policy makers, educators, researchers, and others of the importance of a metacognitive e-learning approach when designing instruction using Course Management Systems. Such a metacognitive approach will improve the utilization of CMSs to support learners

CMS incorporates features and functionalities that can provide extensive scaffolding to learners and support them in becoming self-regulated learners.
Finally, training and support is essential if educators are expected to develop and implement CMSs as powerful learning tools [1].
Walid Qassim Qwaider in (2011), this paper investigates the integration of e-Learning systems and Knowledge Management technology to improve the capture, organization and delivery of both traditional training courses and large amounts of corporate knowledge. First, a model is proposed for the phases of knowledge management. That model is then enhanced with concepts and technology from e-Learning. The model is then used to illustrate real world scenarios that add increasing amounts of knowledge management to an e-Learning environment. Analysis of these four scenarios will help to better understand the practical relationship between knowledge management and e-Learning systems [2].
Suman Ninoriya1in (2011), presents some eLearning tools to enhance their traditional learning systems. These tools may base on content management or learning content management. This paper gives the architecture of this hybrid model known as known as LCMS (Learning Content Management system). [3].
Andreea IONESCU in (2012), the objective of this paper is to present a new e-learning method that use databases. The solution could be implemented for any type of e-learning system in any domain. The article will purpose a solution to improve the learning process for virtual classes.
this paper has presented solution could be a great help in learning process also presented some advantages such as: reducing learning times, improve the teaching process, offer to student /learn new materials, books, examples and course notes[4].
M.SINDHUJA, S.GAYATHR , R.B.AKSHAYA, I.R.PRAVEEN JOE in (2015), In this paper, presents how data mining can be applied to educational systems. It shows how useful data mining can be in higher education, particularly to improve students‟‟ performance. Authors used students' data from the database of final year students‟‟ for Information Technology UG course& collected all available data including their performance at university examination in various subjects. Then applied data mining techniques to discover knowledge. Also clustered the student into group using DBSCAN-clustering algorithm, all these knowledge can be used to improve the performance of student [5].

III. KNOWLEDGE AND KNOWLEDGE MANAGEMENT

Knowledge Management is one of the hottest topics today in both the industry world and information research world. In our daily life, we deal with huge amount of data and information. Data and information is not knowledge until we know how to dig the value out of it. This is the reason we need knowledge management.
Knowledge is “collected from both external and internal sources. Then it is examined, interpreted, refined, and stored in what is called an organizational knowledge base the repository for the enterprise’s knowledge. A major purpose of an organizational knowledge base is to allow for knowledge sharing. Furthermore, some knowledge can be sold to others or traded for other knowledge” [6]
The Knowledge Repositories:

- ***Databases*.**

A database is used to store information about thousands of tables and therefore database is use to structure A Knowledge Repository
A Knowledge Repository is an online database that automatically captures, regulates, and classifies knowledge based information.

- ***Data warehouses*,**
  A knowledge warehouse is the component of an enterprise's knowledge management system where knowledge is developed, stored, organized, processed, and disseminated. (A knowledge warehouse can also be called a data repository
- ***Specially Structured Databases*.**
  A Lotus Notes database generally has a file extension of ".nsf". Within that file, there can be data, design elements, and programming code. Each database file also has its own security in the form of an Access Control List (ACL). Visually

A Notes database is a collection of unstructured data, combined with various design elements that allow you to access and manipulate that data. The Lotus Notes repository manager allows you to gain read access to documents that are stored on Lotus Domino servers, and to place them into the portal.

- ***Electronic Documents.*** Others have been developed around electronic document management systems.

The challenges to learning in knowledge societies are not limited to how effectively helping learners to acquire knowledge and skills, but in helping them to learn how to manage; work creatively with ideas and to contribute to the creation of new knowledge[7].

First Polyani(1962) identified the duality of the knowledge. He divided knowledge into two types [8][9]:

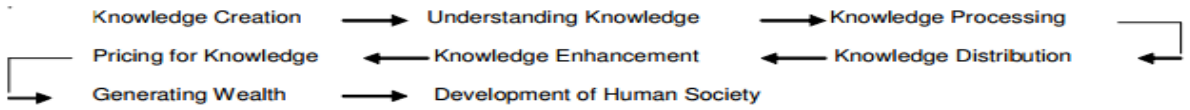
1) Tacit knowledge
2) Explicit knowledge

Knowledge management (KM) is "The process of capturing, developing, sharing, and effectively using organizational knowledge" [10]

KM Organized collection of people, procedures, software, databases, and devices used to create, store, share, and use the organization's knowledge and experience. KM involves the creation, dissemination, and utilization of knowledge comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizations as processes or practices [11][12]. More recently, other fields have started contributing to KM research; these include information and media, computer science, public health, and public policy [13].

The components for KM can be broadly categorized into three classes - People, Processes, and Technology [14].

Finally, Knowledge Management is a process, which deals with knowledge creation, acquisition, packaging and application or reuse of knowledge. It is basically consists of the following four steps: Knowledge Collection, Organization, Data protection and presentation, Dissemination of Knowledge Information. Knowledge Management is the way to keep knowledge growing through sharing and such sharing is best done either in material or human terms. The relationship between the knowledge and social development can be understood with the help of the following:



IV. INFORMATION TECHNOLOGY

Technology (from Greek τέχνη, *techne*, "art, skill, cunning of hand".; and -λογία, *-logia*[l])[15]

Technology is one of the best facilitators of it. ELearning can provide "cradle to grave" learning supports. For offering the optimal learning opportunity, learners' profile should be portable not just between departments within a university or an educational institution, but also between different educational sectors [16].

IT deals with the use of electronic computers and computer software to convert, store, protect process, transmit, and securely retrieve information.

Definition of I.T: The technology involving the development, maintenance, and use of computer systems, software, and networks for the processing and distribution of data [17].

Or **Information technology** (**IT**) is "the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data" [18].

Today, as in other areas of society, information technology and communications have entered the field of education. It is possible to capture and compile very simply and at low cost all kinds of information: administrative data enrollment in schools, colleges or universities, computerized academic records of students, logging in educational portals (e-learning platforms), collaborative learning systems guided by the computer(computer-supported collaborative learning systems, etc.).

V. E LEARNING

As the letter "e" in e-learning stands for the word "electronic", E-learning is referred to as web-based training, or just-in-time training. It consists of modularized training courses that are available over the web anytime and anywhere you have access to the Internet [19]. It is available for personal use only to students who are eligible to register for classes, and staff. Many organizations, businesses, learning institution and individuals are using e-leaning tools to provide training, to teach, to learn and to enhance their existing knowledge.

Or is "the application of Internet technology (intranet, extranet and Internet) in teaching and learning process and information technologies - ICT (Information and Communication Technology) in educational institutions" [20][21][22].

E-learning applications and processes include Web based learning, computer-based learning, virtual classrooms and digital collaboration [23].

THE CATEGORIES OF E-LEARNING

Database e-Learning

- **Database E-Learning:** E-Database Technology E-Learning Solution to supplement instructor-led classes. Online databases are a form of e-Learning that is used today. With online databases, users can browse through different topics to look for an answer or an explanation to various questions. Online databases can also provide step-by-step instructions on how to do things like installation of an additional component to a computer or activation of a certain product [24].

  Databases are the most basic form of e-learning. You've probably seen knowledge databases on Software sites offering indexed explanations and guidance for software questions, along with step-By-step instructions for performing specific tasks. These are usually moderately interactive, Meaning that you can either type in a key word or phrase to search the database, or make a Selection from an alphabetical list.
- **Online support**: Online support is also a form of e-learning and functions in a similar manner to knowledge databases. Online support comes in the form of forums, chat rooms, online bulletin boards, e-mail, or live instant-messaging support. Slightly more interactive than knowledge databases, online support offers the opportunity for more specific questions and answers, as well as more immediate answers [25].
- **Asynchronous training:** Asynchronous training is a combination of the two forms of e-Learning mentioned above. With asynchronous training, students learn through internet-based, network based or storage disk-based modules. Moreover, students can also interact with other students or instructors through e-mail, online discussion groups and online bulletin boards. As with the preceding types of e-Learning, asynchronous training is also self-paced and interactive. Asynchronous technologies support learning and allow more time for student reflection, collaboration, and student-to-student interactions [26][27][28].

  It includes tools used in asynchronous e-learning, the following:
  - E-mail
  - World Wide Web
  - Mailing List
  - Discussion Groups
  - Files Transfer
  - CD
- **Synchronous E-learning (or pedagogy)**: is designed for online users. In synchronous E-learning, teachers and students collaborate at the same time. Content management system for E-learning acts as archives for learning materials which are availed on the web. E-learning pedagogy only delivers curriculum to learners. Establishing ELearning demands different institutional requirements, but in all cases, ensures an established and a maintained system. Synchronous learning comes to the rescue of students [29][30][31][32].

It includes tools used in synchronous e-learning, the following:

- Whit Board
- Virtual Classroom
- Video Conferencing

- Audio Conferencing
- Chatting Rooms
- Satellite Programs

VI. THE USE OF STANDARD IN E-LEARNING

SCORM in E-learning context Sharable Content Object Reference Model is a collection of standards and specifications for web-based electronic e-learning. It defines communications between client side content and a host system (called "the run-time environment"), which is commonly supported by a learning management system. SCORM also defines how content may be packaged into a transferable ZIP file called "Package Interchange Format"[33].
SCORM standards are interested in publishing rather than teachable features of the lesson content [34].
While applying SCORM standards, some factors, which belong to SCOM standards, must be stated. These factors are [35]:

- Interoperability
- Re-usability
- Manageability.
- Accessibility
- Durability
- Scalability

SCORM main aims are: to enable developers to format and package learning content in a standardized way so that the content can be used on all LMSs and shared amongst other members of the learning and teaching community to enable delivery of the learning materials to the learner and tracking of learners' actions and scores (e.g. indicating when learners open a new page, complete a quiz, etc.).
In addition, the SCORM compliant packages include a meta-description file, using the Learning Object Metadata (LOM) standard, which allow us to access the description of the package contents [36].
SCORM was founded to help ensure that course content could build in a standard way. And that each shareable content object (SCO) could be used and reused to create new courseware (Content + Interactive + SCORM).
The SCORM specifications are a composite of several specifications developed by international standards organizations, including the IEEE , IMS , AICC, and ARIADNE [37][38][[39][40].

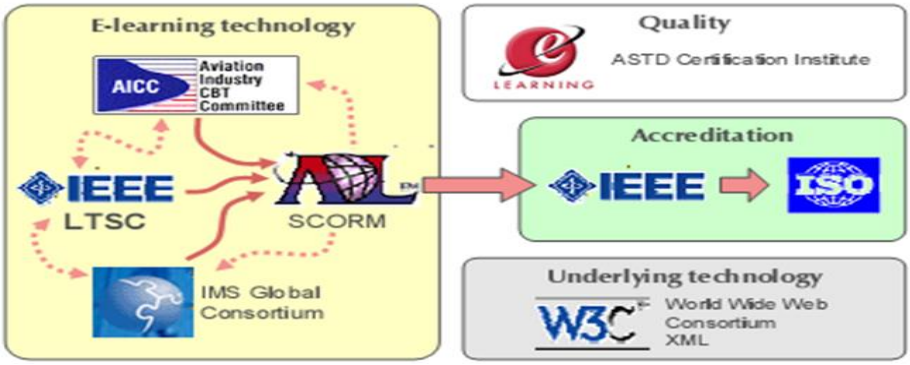


Figure 1. Standards organizations

6.1 SCORM Cloud

SCORM Cloud is an environment which allows us to deliver educational content, collect information about learners and analyze it. It also provides fully functional TinCan LRS.
Cloud enables us to build richer, more interactive applications wherein students and teachers can collaborate in a better manner over shared data such as assignments, tutorials, videos etc. Providing a central platform to students and teachers relieves them from the burden of carrying their work around

between computers/devices at various locations - institute, home. Lastly, applications built on the cloud can capture a lot of analytics data that when warehoused and processed.
SCORM cloud a simple way to deliver e-learning .SCORM Cloud can do everything about what SCORM Cloud can do is right there in the name. First and foremost, it does SCORM and does it well. We apply our philosophy of flexibility in dealing with various interpretations of SCORM to give you a player that just plain works. If the best way to develop your course is with SCORM parameters, SCORM Cloud gives you the best shot at having it work correctly every time.
Add to that the fact that it lives in the cloud. No longer is tracking learners limited to what happens within an LMS. You can launch courses off a Google page or maybe out of your WordPress blog. SCORM Cloud collects all the data needed for scoring assignments or tracking interactions.
it keeps the costs for deploying a SCORM player low you only pay for it when you actually need it rather than paying for a complete integration that you only use occasionally. In addition, the fact that it's a hosted solution means you can have it up and running in no time; no. spending weeks integrating SCORM into your existing system [41][42].

VII. E-LEARNING & KNOWLEDGE MANAGEMENT

E-Learning and KM systems provide knowledge in different forms to the users. This content can be reused, annotated, modified or whatever else is needed for different approaches. Finding effective ways to collaborate, and to create and share knowledge among people who are connected via disperse networks is one of the most challenging tasks.
E-learning system are used to provide training and can be improved to knowledge management system if the start focusing on knowledge community, point to knowledge repository and experts.
A good infrastructure includes databases, computer networks and software. The integration of knowledge management and e-learning is performed by building a virtual learning community. A virtual community can build an interactive learning environment for people. This helps the integration of knowledge management and e-learning.
Knowledge Management + eLearning + Web 2.0 = Leaning
knowledge management systems provide knowledge through content management systems which have search and sort facilities, and also collaboration possibilities with experts and other users on various topics[43][44].

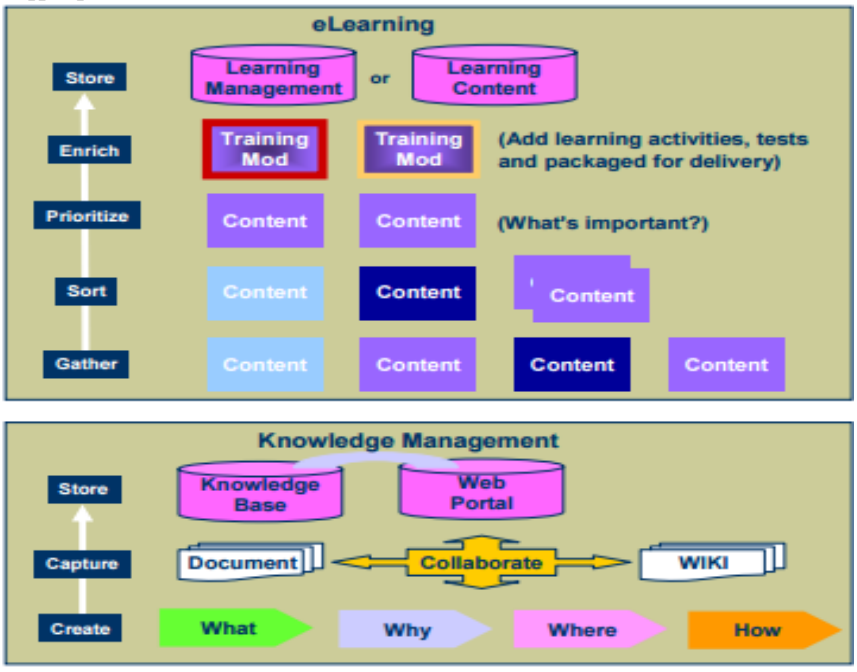


Figure 2. Hybrid eLearning with Knowledge Management

The important of merging KM and eLearning is:

- enhance employee motivation

- increase productivity
- Reduce Costs
- Increase revenue and profits

7.1 E-Learning to knowledge management

E-learning could be a cornerstone of knowledge management(organization learning, life-long learning).e-learning provides a good environment for people in organizations to learn: everywhere, dynamics, non-linear, informal-learning supports sharing knowledge among people and converting tacit to explicit knowledge: wiki, blogs, communication, etc.

7.2 Knowledge management to e-learning

The need of knowledge management in organization offers opportunities and challenges to e-learning (content, methods, effectiveness). Knowledge management tools can support the development of open courses and open sources in e-learning.
Simulations close to the real world are the answer to constructivist learning theories, demanding situated learning with a high degree of engagement of the student. However, the use of computer technology to support learning leading to the development and creation of knowledge requires new pedagogical processes. Thus, the tendency towards technology driven development has led to a focus on the dissemination and acquisition of information. Pedagogic strategies and computer based technologies to support knowledge**.**

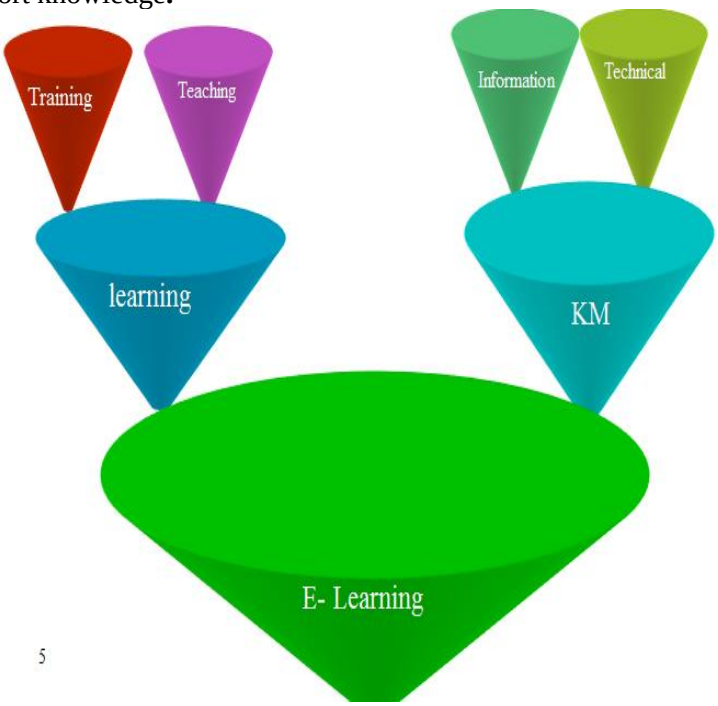


Figure 3. KM To eLearning

VIII. CMS

Content is one of the main products of the eLearning industry that is created and shared rapidly. Content creation is influenced by three main factors, including the eLearning dynamism, Web 2.0 developments, and outsourcing of content creation [45].
A CMS is a software package that lets you build a website that can be quickly and easily updated by your non-technical staff members. Many of the most popular websites in the world use free and publicly available CMS' like Wordpress, Joomla and Drupal [46].

Figure 4. Type of CMS Database

A Content Management System is a series of programming pages connected to a database that allows one to retrieve information from that database in the form of content.
A CMS can streamline and automate the process of creating, approving, deploying, and retiring web content.
Finally, the goal of a CMS is to provide an intuitive user interface for building and modifying webpage content. Each CMS also provides a web publishing tool that allows one or more users to publish updates live on the Web. The editing component is called the content management application (CMA), while the publishing tool is called the content delivery application (CDA). These two components are integrated together in a CMS to streamline the web development process.

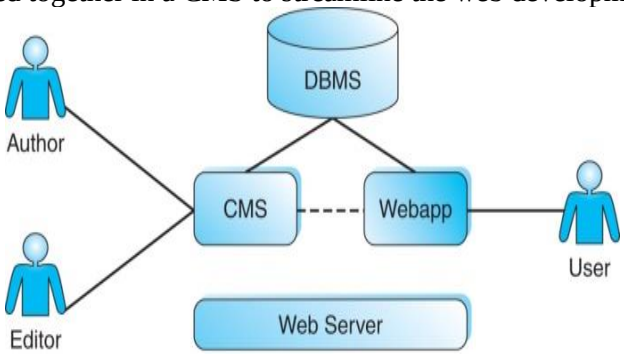


Figure 5. CMS /process

8.1 CMS Database

E-learning makes good use of database and CMS (Content Management System) technologies. These two work hand in hand to store your course content, test results and student records. The data is stored in the database and the CMS provides a user interface for you to add, update and delete data.
CMS DB activity was started many years ago by sub detectors groups. A database allow for data to have complex relationship.
The frontend site can be as simple or as complex as it needs to be, but for a great many sites on the Web, a database can actually be overkill. WordPress is a database-driven application that works well for millions-upon millions so sites.

8.1.1 Working with the WP Database

WordPress is an open source content management system (CMS) that is mainly used to maintain weblogs, but it can also be used to create more static web pages. Placing blog posts, user comments and a layered rights system are standard functionalities of Word Press. Functionality can be extended by plugins and the looks of the system can be customized using themes. WordPress is a popular content management system in the world, used on millions of sites – ranging from small weblogs to large blog networks. It has a market share of 55.5% in the CMS market, making it the market leader [47].

A WordPress theme is simply a collection of scripts, style sheets and images which get combined, processed and the generated content is sent back to the client. A user can install any theme which is compatible with his or her WordPress version. There is no central body governing the quality and correctness of a theme. As theme developers are free to build them almost arbitrarily, numerous security and performance flaws occur. The WordPress plugin is a pluggable piece of software which enhances the basic WordPress functionality thus enabling its users to heavily modify their WordPress-based web application and sites [48].

WordPress database stores all of your website content. This includes blog posts, pages, comments, and custom post types such as links, from entries. It also stores website settings, theme settings, and plugin settings. If you update your website regularly, your database will grow larger over time a larger database can greatly affect the performance of your website as it takes longer for your server to retrieve information from database tables. This is why database optimization is so important.

WP Database is performing some common tasks on the database. We will be by-passing tasks such as working with the SQL database, inserting and updating data, getting rows and columns and other similar functions [49].

IX. LEARNING SECURITY

Security refers to freedom from harm. Harm, in the eLearning context, may refer to the following points.

Corrupted or lost communications, messages, grades, data, or work.

- A compromised learner or instructor identity.
- Stolen personal or private information.
- Stolen or compromised student ideas and innovations.
- Corrupted social technical systems
- Indeed, the following aspects can represent Security:
- Confidentiality.
- Integrity and Authentication.
- Non-repudiation

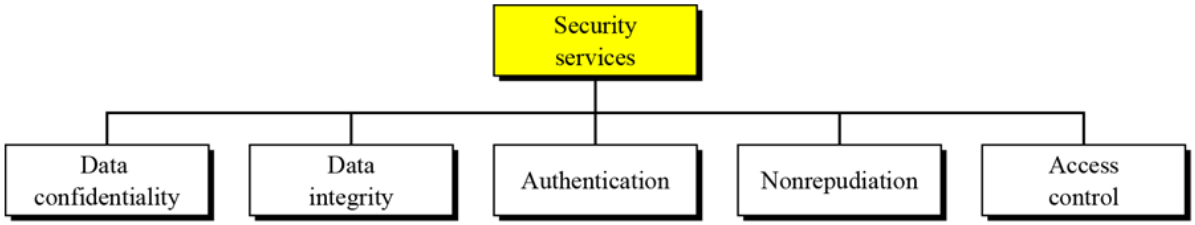


Figure. 6. Security Services

E-Learning security is the process of preventing and detecting unauthorized use of your computer System. Prevention measures help you to stop unauthorized users from accessing any part of your computer system. Detection helps you to determine whether or not someone attempted to break into your system, if they were successful, and what they may have done. The online learning should not involve the incurring of legal liabilities. Ultimately secure learning enables learner success

Information security is the process of protecting information from unauthorized access, use, disclosure, destruction, modification, or disruption Information security is an essential infrastructure technology to achieve successful information-based society [50].

Through Network Information Security in Education we understand the transmission of basic safety information to the young, citizens using the internet

9.1 Information Security

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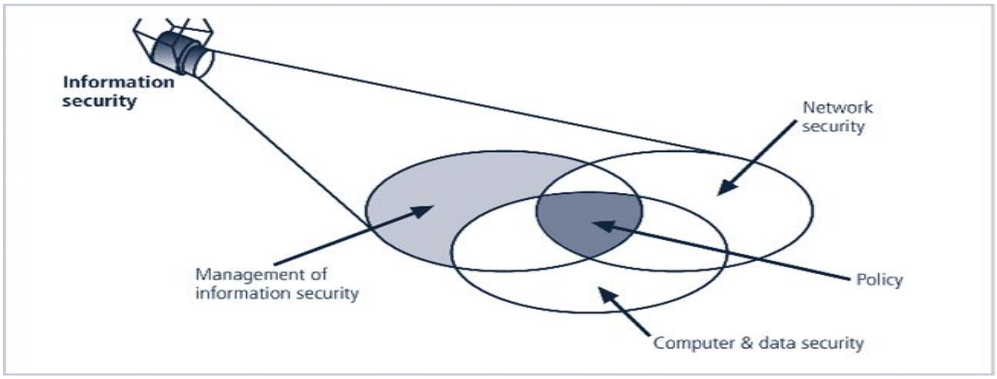


Figure 7. Information Security

9.2 CRC

CRCs are based on the theory of cyclic error-correcting codes. The use of systematic cyclic codes, which encode messages by adding a fixed-length check value, for the purpose of error detection in communication networks, was first proposed by W. Wesley Peterson in 1961[52].
The 32-bit CRC function of Ethernet and many other standards is the work of several researchers and was published in 1975.
Or Cyclic Redundancy Check **(CRC)** is a technique for detecting errors in digital data it is not used for the purpose of error corrections. CRC are simple to implement in binary hardware, easily to analyze mathematically and good at detecting common error caused by noise in transmission channels. The technique is also sometimes applied to data storage devices, such as a disk drive. CRC are based on the cyclic error correcting code which use of systematic cyclic codes to encode message by adding a fixed length check value, for the purpose of error detection in communication networks, Because the check value has a fixed length, the function that generates it is occasionally used as a hash function. This method can detect and correct errors in sequences of bits and can therefore be used in data transmission as well as in data storage to protect files from errors on servers or databases [53].
The CRC remainder is appended to the end of a data stream. The resulting data becomes exactly divisible by a second, predetermined binary number. At its destination, the incoming data is divided by the same number. The diagram below will show you the Sequence of Events that takes place when using CRC.

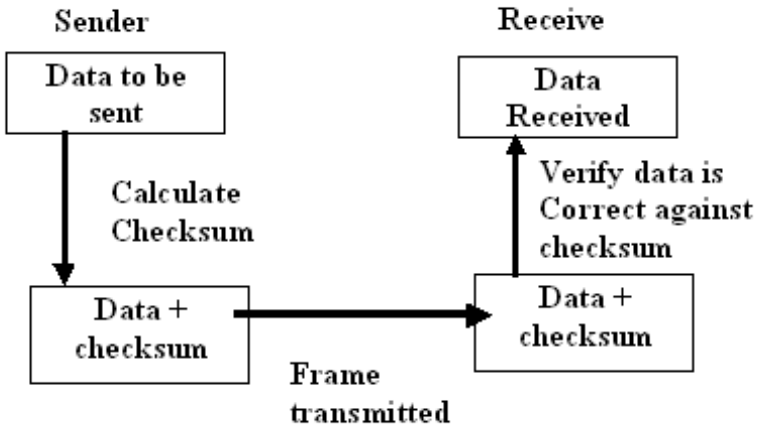
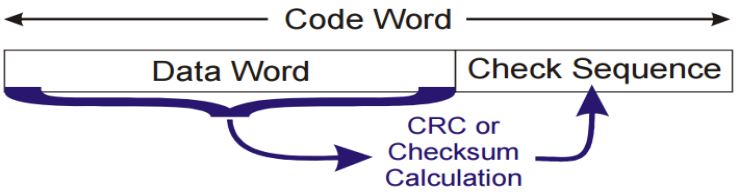


Figure 8. Sequence of Events that takes place when using CRC



Checksum: checksum field is used for error detection formed by adding bit strings interpreter as integer [54] [55].

CRC Generation [56][57]

CRC generation is all about finding the FCS given the data (D) and a divisor (P)

There are three equivalent ways to generate the CRC code:

- ❑ Modulo-2 Arithmetic Method
- ❑ Polynomial Method
- ❑ Digital Logic Method

CRC Algorithm

✓ **For Computing CRC** :

- The CRC Algorithm is based on Polynomial arithmetic:
- Let the message that we have to send has K bits(denoted by M(X) in Polynomial form having degree (K-1) The Sender and the receiver are agreed upon a generator polynomial having r bits (denoted by G(X) in Polynomial form Having degree(r-1). The generator polynomial is also called "Divisor"
- Now, append (r-1) zero bits to the LSB side of the message M(X) so it will now contain (k+r-1) bits and corresponds to the polynomial $x^{(r-1)}M(x)$.
- Divide the polynomial $x^{(r-1)}M(x)$ by Divisor, using modulo-2 subtraction (bit by bit XOR operation). Add the remainder R(x)(called Frame check sequence) to $x^{(r-1)}M(x)$ .using modulo-2 addition (bit by bit XOR operation). This is the message that will be transmitted by the transmitter denoted by T(X).

✓ **For Error Detection** :

- Suppose that a transmission error occurs, so that the received message at the receiver is T(x)+E(x), instead of T(x).Each 1 bit in E(x) corresponds to a bit that has been inverted.
- The received message at the receiver end is divided by G(x),i.e. [T(x) + E(x)/G(x)].Since T(x)/G(x) is 0, so the result is simply E(x)/G(x).
- If E(x)/G(x)=0 than there is no error in the received message , otherwise there is an error.
- The following type of errors can be detected using CRC:
  - If G(x) has more than one bit and the coefficient of x^0 is 1, then all single bit errors are detected.
  - If G(x) is not divisible by x (the Coefficient of x^o is 1),and t is the least positive integer (0<t<n-1) such that G(x) divides x^{t+1}, then all isolated double errors are detected.
  - If G(x) has a factor (x+1), then all odd numbered errors are detected[58][59][60]

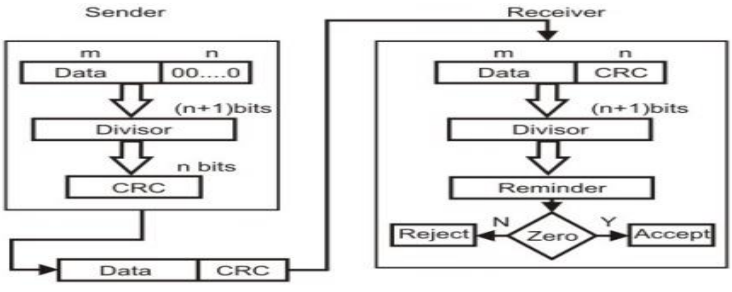


Figure. 9. Basic scheme for Cyclic Redundancy Checking

X. EDUCATIONAL DATA MINING

Educational data mining (Educational Data Mining, EDM) is the process of transforming raw data collected by national education systems into useful information that can be used to make informed decisions and answer research questions [61].

Or Educational data mining (EDM) is the process of analyzing data obtained from schools, students and administrators. The data that is analyzed is obtained from computer information systems, such as test scores and attendance records. Data mining looks for patterns and associations to draw conclusions about performance and behavior.

Data mining is a way to gain insight into the minds of students and administrators, which may be difficult to uncover with direct research methods. Some colleges and universities may analyze the results of graduating students' performance on national standardized tests to monitor the quality of its classroom instruction. High scores in certain subject areas over others may indicate a need to adjust the method in which that material is delivered. Other learning tools besides the traditional lecture may be tried as a result of data mining.

The Goals of EDM:

1. Predicting students' future learning behavior by creating student models that incorporate such detailed information as students' knowledge, motivation, metacognition, and attitudes;
2. Discovering or improving domain models that characterize the content to be learned and optimal instructional sequences;
3. Studying the effects of different kinds of pedagogical support that can be provided by learning software.
4. Advancing scientific knowledge about learning and learners through building computational models that incorporate models of the student, the domain, and the software's pedagogy

Application of data mining in education sector is an emerging trend. The data mining terms, tasks, techniques and application can be used to developing data mining in education sector [62]. Clustering and classification both are very useful to improve the performance on education sector [63][64].

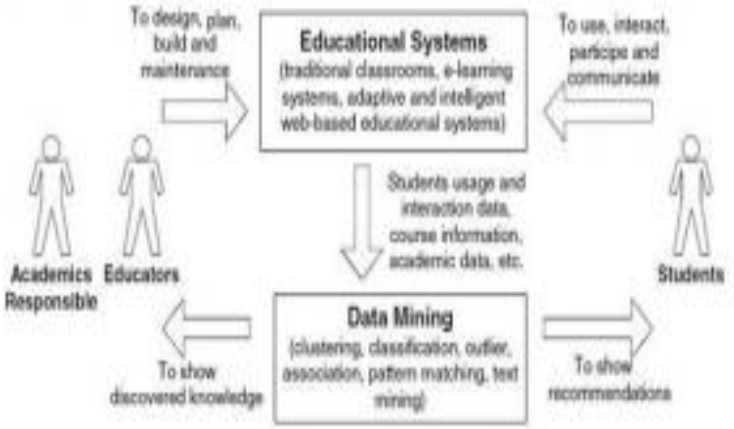


Figure 10. Data mining applications in the education sector

In educational data mining, clustering is play very important role. It is used to provide group the students according to their behavior e.g. clustering define clusters according to active student from non-active student according to their performance in activities [65].

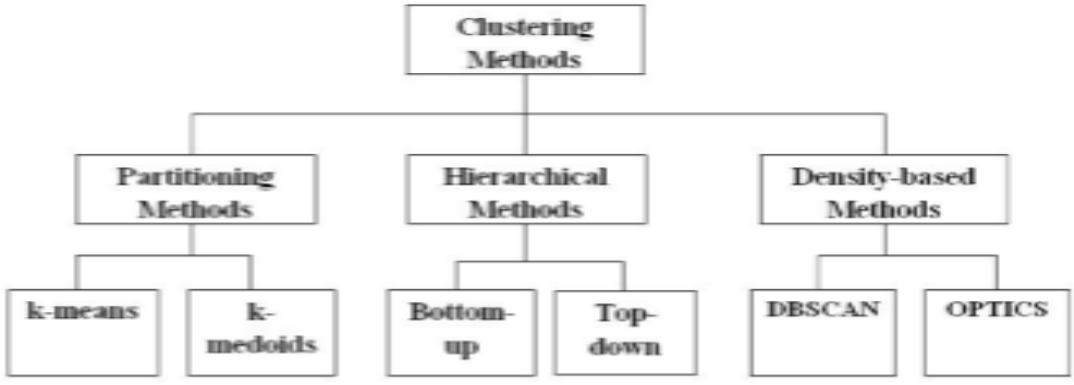


Figure 11. Clustering Methods

10.1 Dbscan Clustering Algorithm

Clustering is the process of grouping a collection of objects (usually represented as points in a multidimensional space) into classes of similar objects. Cluster analysis is a very important tool in data analysis. It is a set of methodologies for automatic classification of a collection of patterns into clusters based on similarity. Intuitively, patterns within the same cluster are more similar to each other than patterns belonging to a different cluster. The process of making data clusters is defined in fig. 12

Figure. 12. Clustering Process

DBSCAN (for density-based spatial clustering of applications with noise)[66] is a data clustering algorithm proposed by Martin Ester, Hans-Peter Kriegel, Jorge Sander and XiaoweiXu in 1996 It is a density-based clustering algorithm because it finds a number of clusters starting from the estimated density distribution of corresponding nodes. DBSCAN is one of the most common clustering algorithms and also most cited in scientific literature

The DBSCAN can also determine what information should be classified as noise or outliers. In spite of this, its working process is quick and scales very well with the size of the database – almost linearly [67][68].

Density Based Scan (DBSCAN) Algorithm is as follows:-

• Arbitrarily select a point p

• Retrieve all points density-reachable from p for a given Eps (Maximum radius of the neighborhood)and Min Pts(Minimum number of points).

 if p is a core point, a cluster is formed.

from p and DBSCAN

visits the next point of the database.

• Continue the process until all points has been processed

The DBSCAN algorithm is [69][70]]:

Input: V: a data set containing n objects or values

ε: the radius parameter

Minpts: the neighbourhood density threshold.

Output:

Density-based clusters

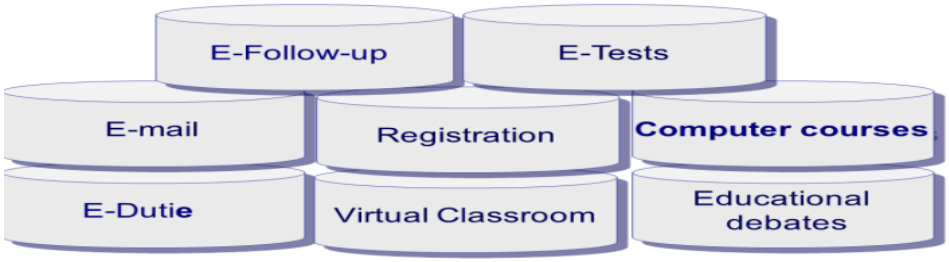
Method:

1. mark all objects as unvisited
2. do
3. select an unvisited object R, randomly;
4. mark R as visited
5. if the ε-neighbourhood of R has at least Minpts objects
6. create a new cluster C, and add up R to C;
7. let the set of objects be N in the neighbourhood of R;
8. for each point R1 in N
9. if R1is unvisited
10. mark R1 as visited;
11. if the ε-neighbourhood of R1 has at least MinPts points, add those points to N;
12. if R1 still does not belong to any cluster, add R1 to C;
13. end for
14. output C;
15. else mark R as noise;
16. until no object is unvisited;

XI. PRACTICAL PART

11.1 Databases

E-learning makes good use of database and CMS (Content Management System) technologies. These two work hand in hand to store your course content, test results and student records. The data is stored in the database and the CMS provides a user interface for you to add, update and delete data.
E-Learning databases of the proposed system:



11.2 Knowledge databases: most basic form of e-learning

- Indexed explanations and guidance, step-by-step instructions
- moderately interactive – type in a key word or phrase to search the database, or make a selection from an alphabetical list

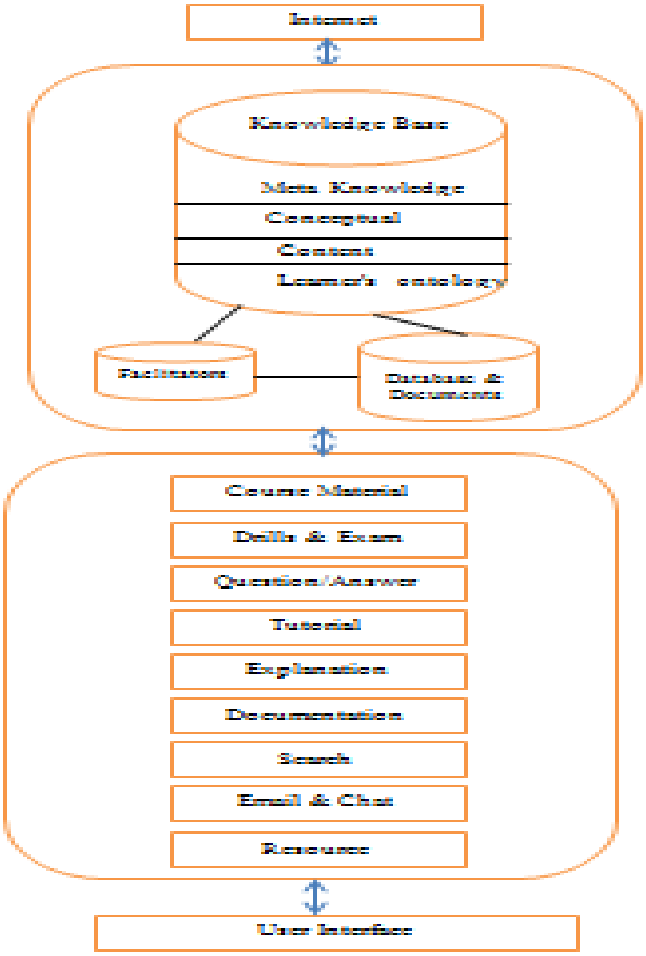


Figure. 13. Knowledge databases

Collaborative learning is used to create collaborative where students are able to socially interact with other students, as well as Teachers. via discussions and knowledge sharing where students can generate ideas to expand their knowledge of a particular subjects of the Arabic language. The proposed system offered collaborative environments through using chats, email and discussion forums.

11.3 E-Learning Data Model

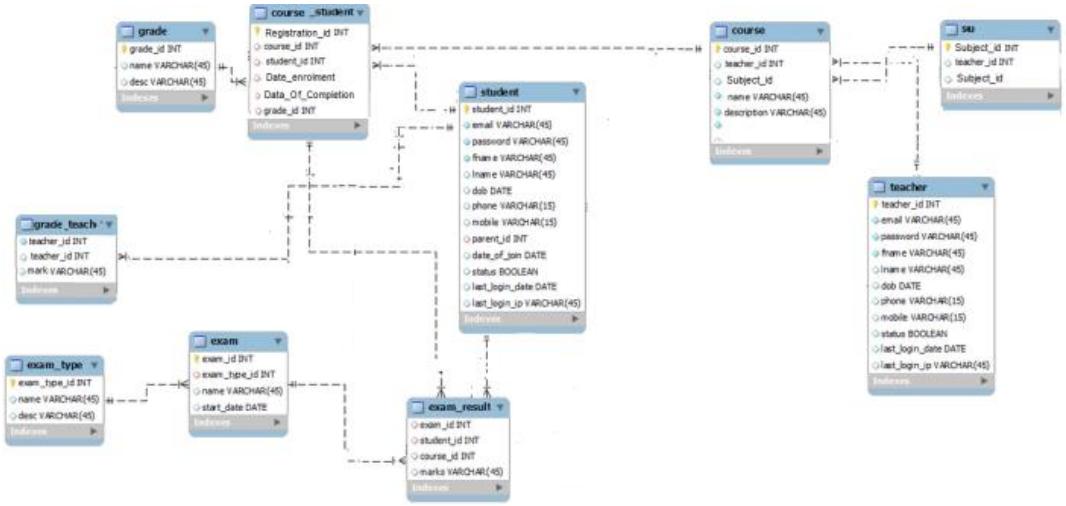


Figure. 14. Database Normalization

11.4 Performance Evaluate

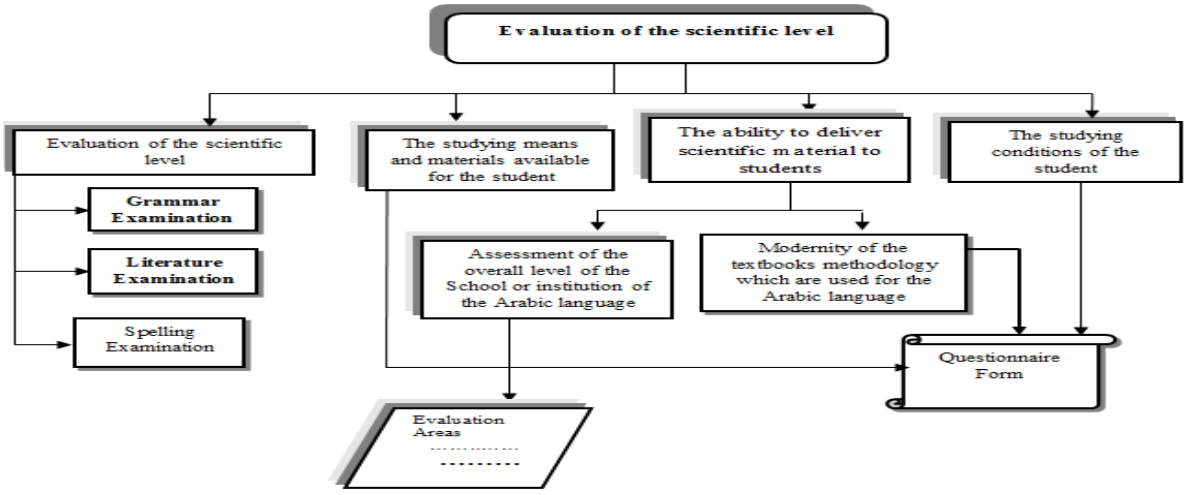


Figure. 15. *Performance Evaluate*

Tools Testing and quizzing in this website will usually provide the user with results instantly. This is good for students because it allows them to know what they did wrong immediately, what they need to focus on, and how to improve should they have to retake the test. Keeps learners engaged Tests and quizzes have always been a motivator to study harder when students know that their progress will be judged upon an exam, a performance review etc. It sets a deadline for when material needs to be learned by and diligent students know they must adhere to that. Further considerations The use of different forms of testing, such as multiple choice tests, fill-in-the-blanks, true or false, or essay questions can also be used to assess the progress of students with different learning styles, some of Modules schema Tests and Quizzes in website are show as follow:

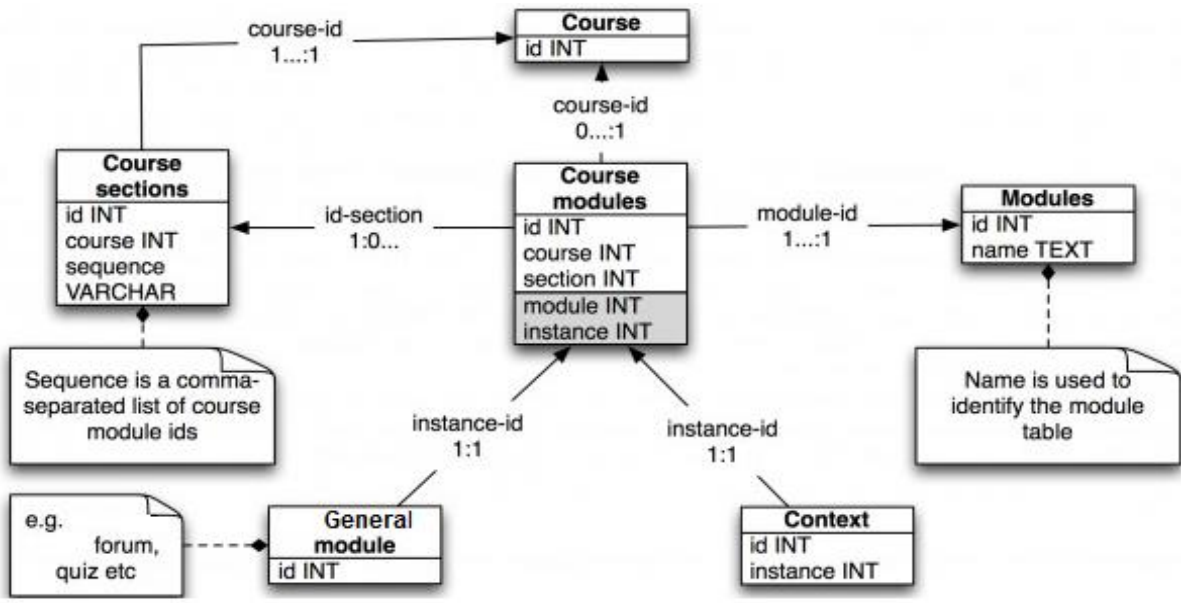


Figure. 16. Module Database Schema

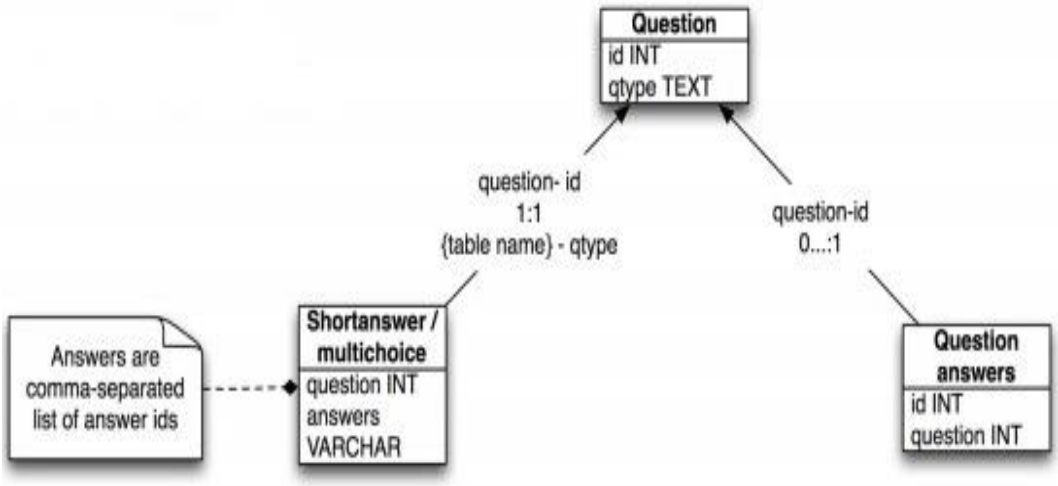


Figure 17. Short answer and multi choice questions

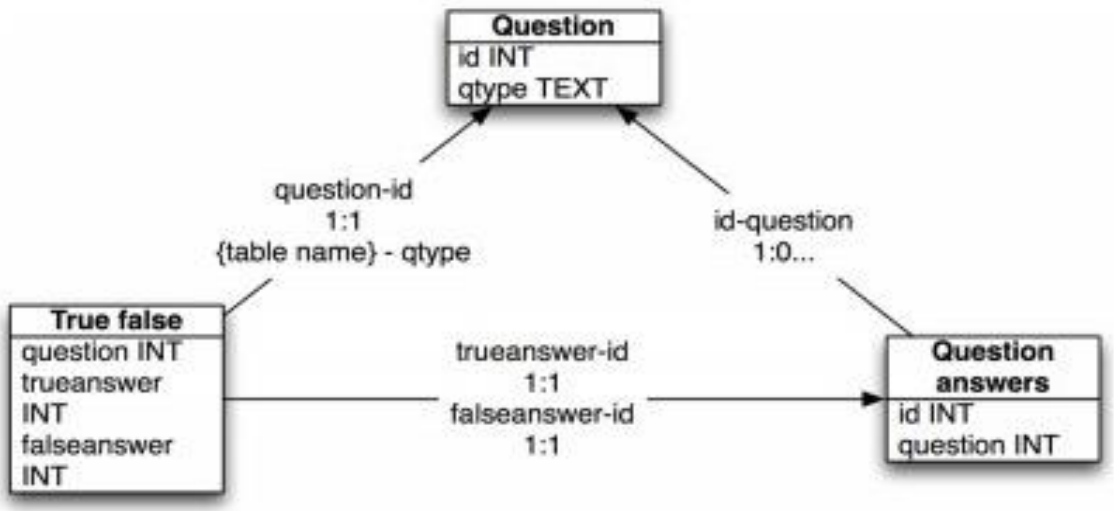


Figure 18. . True/False questions

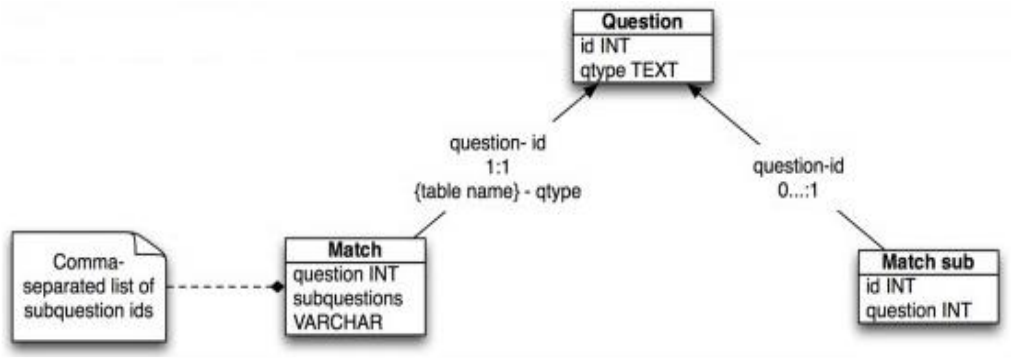


Figure 19. Matching questions

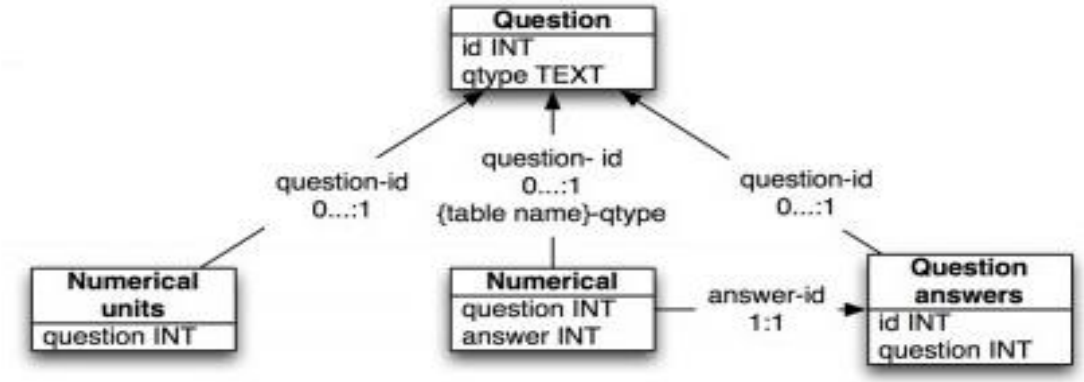


Figure 20. Numerical questions

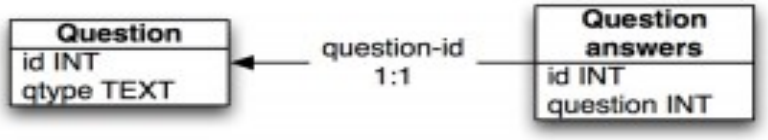


Figure 21. Easy questions

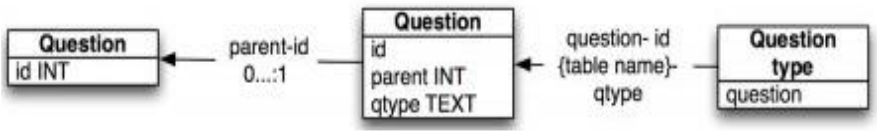


Figure 22. Multi answer questions

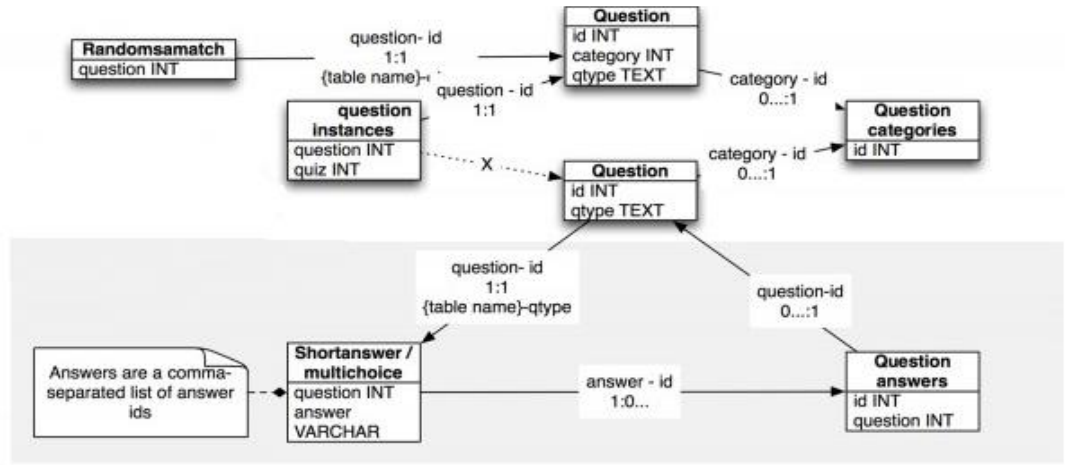


Figure 23. Short answer match questions

Table 1. DBSCAN Algorithm Result

Cluster Data Objects	Epsilon	minPoints	No. Of generate Clusters	Elapsed Taken	Time Taken	Clustered Instance					
						0 (Weak)		1 (Medium)		2 (GOOD)	
170	0.9	6	3	1	0.1 Seconds	No.	%	No.	%	No.	%
						85	50	51	30	34	20
Uncluttered Instance: 1											

11.3 Website

Some of website forms

Figure 23 . Main form Website

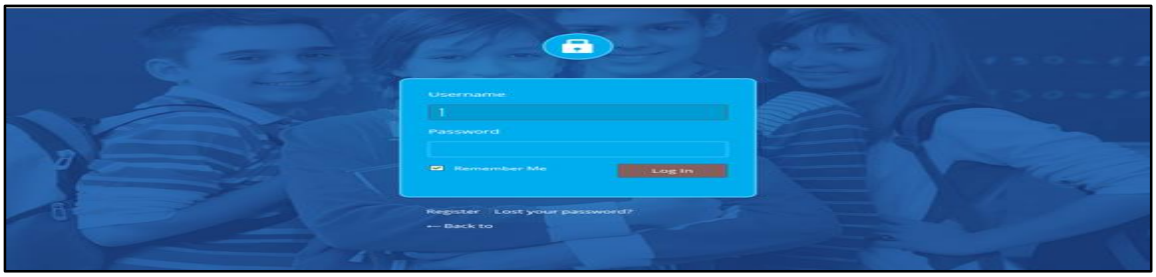


Figure 24. Login Here Form

Figure 25. Register Form

Figure 26. Contact Us Form

Figure 27. Test&Examination

Figure 28. Evaluation(assessment)

Figure 29. Perform Evaluation Teacher

Online lessons include:, images, texts and interactions.

XII. CONCLUSION

1.The site provides flexibility in the selection and presentation of exercises based on the level of student's achievement, where exercises are stored in a special rule (database) and each exercise has its own directive for the purpose of facilitating the calling process, after the solution steps (step by step) with follow-up of the system for the student to lead her from the starting point to the achievement of ultimate goal in solving the problem, and if the answer was wrong the site displays directions and determines the location of the error and its type, and how to correct it, as well as the site displays similar exercise which depends on the error type for the purpose of improving the students' knowledge and completion of it in addition it provides the assistance during the solving of the exercise when requested by the student or through the intervention of the site when there is a certain error in the solution, in addition it provides the students with the typical answers to each question so as to achieve the goal of improving the scientific level of low-leveled student in Arabic language as the strategy of solving the problem, achieves educated individually in a high degree.

2. well as the information (knowledge) management has provided support and backing for individual learning and learning groups as it strengthened collaboration among the members of the students groups, members of the teachers groups and encouraged them to share their experiences and also helped information management to participate in the content The use of knowledge management helped the students to reach the experts to ask questions and to get more information.

3. Proving the effectiveness of the educational bag which is available in the site to focus on the information which requires close inspection, as after subjecting the low-leveled students to strengthening and enhancing course by using the scientific or the educational programmed bag in the site and after testing them, they have proven to be improved in their performance .

4. The learning management system is important for the electronic educational process management on comprehensive educational basis which owns all the components for E. management and providing basic elements and assistance within international standards and regulations .

5. The electronic content management systems include electronic management and regarded as an extension to it in developing the digital content for electronic materials to be an integrated system in terms of organization and in terms of the quality of education.

6. The LCMS supported the E-learning process in terms of (Material (scientific content), a faculty member in the Department of Arabic Language, students of the Department of Arabic Language, communication media or communication (Direct:, the interaction between the student and the teacher in the same space and time, and indirectly: through intermediary or mediator such as books and lectures, computer networks, mobile phone, International Network for Information

7. The usage of the CRC algorithm to maintain the confidentiality of information which can be accessed by authorized persons only due to the sensitivity of the information related to the assessment of the Arabic language teachers.

8. Content management system that was design for Institute of Qualifying Women Teachers contain the characteristics of navigation within the content and provide the capabilities to facilitate the learning process of the learner and the transformation from information into other using a scalable hybrid algorithm opens the possibility to upgrade and update our algorithm with new techniques than can emerge.

XIII. FUTURE WORK

1. Evaluation Perform could be done using more data mining techniques such as AutoClass, K-means, Naive Bayes, and others.
2. a way to generalize the study to other department of the institute of qualifying women teachers in order to improve learning

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AUTHORS' BIOGRAPHY

She has been working as a teacher in the MIS Department at The Faculty of Administration & Economic at Mosul University. She has published research papers in conferences& journals. Her areas of interests are Databases, Knowledge Management, Data Mining, Data warehousing Artificial Intelligence, Computer Networks, Security, Information systems, Web Technologies.