

# Web Based Application Implementation to Teach Engineering Students EaVaMa Concepts

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**ABSTRACT:** Web Based Application for Student is the computer and network enabled transfer of skills and knowledge. It includes out-of classroom & in-classroom educational experiences via technology. It is naturally suited to distance learning and flexible learning. It is available anywhere, anytime. It is a self-paced interactive instructive presented over the Internet to browser equipped learners. The E-Learning solution is empowering, engaging, effective and economical.

Once developed, the system will then be evaluated for effectiveness in enhancing learning experience of students with regards to Earned Value Management in any discipline.

**KEYWORDS:** Web based application; Project management; Students; Earned value management; EaVaMa

## I. INTRODUCTION

Our EVM system is implemented using services like login service, question service, scrap service, upload service, remove service, exam service, and course manage service, exam question service. The system provides administrative services, faculty services & student services. The system provides numerous numbers of features for students as well as for the faculty. Along with "scrap sending" feature, the system also provides Chat feature for communication between students & faculty

Early E-Learning systems, based on computer based learning (CBL) & training often attempted to replicate autocratic teaching styles whereby the role of the E-Learning systems was to transfer knowledge, as opposed to the systems developed later which were based on computer supportive collaborative learning (CSCL) which encouraged the shared development of knowledge. Nowadays, it is an increasing trend to create virtual learning environment (VLE). The courses offered by the environment is interactive.

Paper is organized as follows. Section II describes effectiveness in improving learners learning experience. The figure represents system architecture of EaVaMa which is a three tier web based system technique that is given in Section III. Section IV presents effectiveness in improving students' learning experience. Finally, Section V presents conclusion.

## II. RELATED WORK

Many employers and learners cannot afford time to a class. Travelling itself makes the learning process expensive & disruptive. E-Learning is revolutionizing the learning world by eradicating the geographical boundaries. The resources are available 24\*7 a week, and any computer enabled with Internet facility can use the system. E-Learning ranges over a number of subjects & has a number of features

First year project management students have challenges in comprehending financial analysis (Net Present Value, Return On Investment and Payback Period) methods which are used in selecting a suitable project. One of the important factors to this challenge is that for the very first time many of them are encountering these concepts and

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methods. As to develop their level of confidence, they require an intensive level of guidance and practice so and also to re-enforce these concepts in their minds. Teachers are not always available for guiding students through in their journey of knowledge discovery of financial analysis methods. This concept proposes the use of a web-based, problem-based interactive system called NeRePa, to help students learn financial analysis methods. This application is aimed at improving students' understanding and learning experience on financial analysis methods. Such a program enables learners to gain hands-on problem-solving skills and knowledge. This paper is in the process of developing the NeRePa application. Once it has been fully developed, the tool will then be measured for its effectiveness in improving learners learning experience with regard to analysis of financial methods in project management [2]. It describes a logical research study focusing on the use of a particular computer program group to teach project management to UK-based students of business management. This particular computer program group is widely used in the business world but its accessibility and ease of understanding for student of business management has not been tested previously. An empirical study was undertaken in 1994 among third-year business studies undergraduates based at the University of Westminster, London. It discuss the approaches both students and staff members have to inherit to get the best out of the commercially produced computer-based training package. The difficulties in ascertaining the role of computer-based training program group in any knowledge gained by students are acknowledged. Information used was based on diaries of students, questions and group talks. [4].

Knowledge systems implement the heuristic human reasoning through specific ways, functions, in order to solve problems that do not have a traditional algorithmic solution. Finding on this paper is being done in numerous organizations all over the world, from higher education laboratories to research institutes and software development organizations.

A first research project, aimed at gathering information about the State-of-the-Practice in building knowledge-based systems with practical applications, needed a preliminary study to ascertain if KBSs still exist today as a research topic, or the interest in them actually faded. The study was also required for finding organizations currently building KBSs for different domains. The paper aim was to list the program and/or knowledge engineering methods employed by the given organizations, in order to draw a comprehensive image (State-of-the-Practice) of the field. The recent paper contains the results of this primary study only.

A study project re-used the results of the primary study, focusing on the study of Knowledge Based System successful implementations as a basis for building a method that would allow practitioners to choose the most appropriate KM tools for each organization's specific problems and situations. The project was the interest in studying the causes of Knowledge Based System rejection by the learners. Any way to map the identified applications of Knowledge Based System to different phases of knowledge management life cycle is also presented [5].

On the basis of problem learning that is pedagogical strategy that centers learning activities on the investigation and development of answer to complex and authentic problems. The difficulties occur when implementing such ways in school education. To find those difficulties, a software tool called INDIE was built to create online interactive learning environments where learners can run simulated experiments, analyze test results, form rationales, and construct arguments to support possible hypotheses. This article focuses on how INDIE supports problem based learning by creating an authentic context that incorporates important aspects in real life, providing tools to help learners perform problem-solving and receive coaching and critiquing, providing support for instructors to assess student understanding and provide feedback, and using an interface that allows open-ended inquiry and exploration. This present primary results showing Corrosion Investigator, a learning environment delivered by INDIE, to be beneficial for both the students and teaching staff in a class. The application of new technology into educational activities with the aim of improving teaching and learning has increased in recent times. Computer-based interactive training enables self-directed learning and skills acquisition, an assertion supported by [7]. Furthermore, computer-based systems also offer supportive environment to students [7] and are supplemental learning tools which provide immediate feedback [8].

Online learning platforms provide an interactive environment for communication among learners and educators. Reference [9] contends that online learning equips educators and learners to engage in collaborative and cooperative activities even beyond the lecture room. Web-Based Learning (WBL) provides many possibilities to students, including the freedom to choose where to learn, when to learn and at what pace. According to [10], one of the benefits of web-based learning systems is that students learn as active participants and they are self-directed.

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Lessons in WBL are presented using multimedia material like text, animation, graphics, video and sound with communication tools [11]. WBL systems have been developed to cover different areas for different purposes. Lessons in WBL are presented using multimedia material like text, animation, graphics, video and sound with communication tools [11]. WBL systems have been developed to cover different areas for different purposes.

Reference [7] developed online interactive learning system called INDIE. The students use the system to run simulated experiments, analyze test results, form rationales and construct arguments to support or disprove possible hypotheses. Garyfallido and Ioannidis [12] developed a web-based application used for teaching students energy concepts dealing with renewable energy and non-renewable energy forms

### III. PROPOSED WORK

The EaVaMa system which we have built acts as an interactive media between the teachers and the students. The system acts as a forum where transfer of knowledge takes place. The EaVaMa system provides the following features:

- Any user can create their own profile by registering & thereby logging into the system.
- A user can upload their profile picture; change/update various features associated with their profile.
- Various courses are provided in the system.
- Any course being provided can be activated, deactivated or deleted from the EaVaMa system.
- Any file of any of the specified courses/subjects can be uploaded or downloaded in the system.
- Students can post their queries. Teachers could thereby answer their questions and post them into the portal.
- The system provides online-exam features. The exam is multiple choice questions type, each question associated with 4 options.
- Online exam is associated with evaluation procedure.
- A user can also view the entire set of questions available for a particular subject.
- Scrap writing facility. Each user is provided with a scrapbook; one can write scrap to another user.
- Online CHAT option is also present. Here student can interact with other student or teachers (whoever is online) and vice versa.
- Student can make many friends in the system, by sending friend requests & thereby accepting or rejecting them.
- System is associated with a feedback facility.
- There is also a searching facility present.

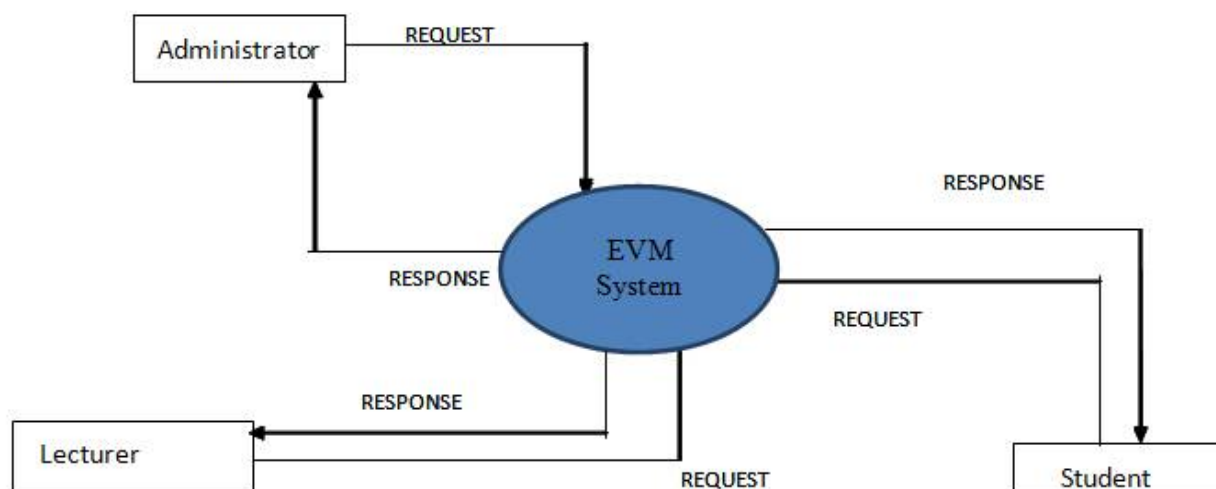


Fig. 1 – Framework of EaVaMa System

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*EaVaMa* is a three-tier web-based system and Fig. 1 above presents the system's architecture.

The architecture has the following components:

- Administrator interface (PHP) – It is a gateway for an Administrator who is registered on the system to interact with it and will decide that whether the sign up requests from students or Lecturers will be accepted or not.
- Lecturer interface(PHP) – It is a gateway for a lecturer who is registered on the system to interact with it.
- Student interface(PHP) – It is a gateway with which an authorized student interacts with the system.
- Web-server (WAMP)– It is an interface between Administrator interface, lecturer interface or student interface and the system's database server (MySQL Server). It hosts the *EaVaMa* system.
- Database server (MySQL Server) - Stores the data for the system.

The *EaVaMa* system which we have built acts as an interactive media between the Lecturer and the students. The system acts as a forum where transfer of knowledge takes place. The *EaVaMa* system provides the following features:

- Any user can create their own profile by registering & thereby logging into the system.
- A user can upload their profile picture; change/update various features associated with their profile.
- Various courses are provided in the system.
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- Any file of any of the specified courses/subjects can be uploaded or downloaded in the system.
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- Scrap writing facility. Each user is provided with a scrapbook; one can write scrap to another user.
- Online CHAT option is also present. Here student can interact with other student or Lecturers (whoever is online) and vice versa.
- Student can make many friends in the system, by sending friend requests & thereby accepting or rejecting them.
- System is associated with a feedback facility.
- There is also a searching facility present.

### SCOPE OF THE SYSTEM

There are three users in the system:-

- Administrator
- Student
- Lecturer

Following are the actions/privileges associated with each of the three users:

#### ADMINISTRATOR:

- Administrator is the person who will decide that whether the sign up requests from students or Lecturers will be accepted or not.
- Administrator can block or remove any user profile as required.
- Administrator can block or remove any course being provided by the system.
- Administrator can remove any uploaded file.

#### STUDENT:

- A student can create and update their own profile.

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- They can send and accept friend request.
- They can send and receive scraps to and from friends in their own friend list.
- A student can post his questions, queries and answer any question posted by another student.
- A student can also solve queries provided by the other students.
- A student can give online exam within the given time limit provide by the system.
- A student can view all the question sets for a selected course provided by the Lecturer in the system.
- They can download files that are uploaded by Lecturers or administrator.
- A student can send feedback.
- A student can use the Chat service to communicate with the Lecturers or/and the other Lecturers.

### LECTURER:

- They can create and update their own profile.
- Lecturer can post exam questions.
- Lecturer posts the solution to the questions/queries provide by the student.
- Lecturer can upload files that may require by the students.
- Lecturer can also delete files created by his own if he feels those are not appropriate.
- Lecturer can use the chat service to communicate with the students or/and the other Lecturers.

Our E-Learning system is built using SOA. The various services which we have built to design the system are

#### Login Service

Login service provides two operations namely Login and Logout. The Login webmethod enables any user (there are three kinds of user possible into our system as already mentioned) to log into our EaVaMa system.

#### Exam question service

This service allows the teachers to give a large dataset of questions to the students. The two operations associated with this service are postQuestion and updateQuestion. Teacher can post any question of any of the specified subject. The questions are of multiple choice type (MCQ). Each question is followed by 4 options. Only one of the options is incorrect. The answer is also provided along with the question.

#### Question service

The service provides two operations namely submitQuestion and answerQuestion. submitQuestion allows the student to post their queries about any subject or course which is provided by our E-Learning system. Each question post is associated with the date of questioning and the name of the student raising the question. Similarly, the second operation answerQuestion allows any teacher or any other student logged into the system to answer the question. Each question can be given numerous answers.

#### Course manage service

This is the main service provided by our E-Learning system. The system provides various courses of different subjects (e.g. Introduction to computing). The courses are managed, manipulated according to the operations provided by this system. There are three operations namely courseAdd, courseActivation and courseDelete. courseAdd allows addition of any subject along with its details into the course table of the database. Any student can opt for only those courses which are present in our system. courseActivation feature can be decided according to the datatype "active". Only those

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courses whose active value is set are available. Administrator can reset the value of “active” if he feels that no longer the course is needed. Students who may have earlier opted those courses no longer can enjoy the resources of the same earlier provided by the system. This is more like blocking the course. The resources are not deleted from the main database. Any time the administrator can again set the datatype “active” to bring the course back. Another operation called courseDelete fulfills this purpose. The entire course along with its details is deleted from the system. The student can never view the resources of the same. Each student can enroll for more than one type of course. The system provides a rich set of knowledge base which makes the system interesting.

#### Scrap service

This service provides the feature of sending scraps. The operation called postScrap. Each scarp is associated with the name of the sender, name of the receiver and the date of post of the scrap. This is similar to the concept of scrapbook provided by many of the today’s social networking sites.

#### Upload service

Each of the user can upload various resources into the site. They can upload various files of the courses specified from their computer; so that the other users can respectively download them in their own computer. This forms the backbone of the E-Learning system (the administrator has the authority to disable the file access if he feels like). As already mentioned each of the user has a profile and so he/she can upload any profile picture of his choice.

#### Remove service

This service is exactly opposite to the service provided by the upload service. The files or the photo uploaded by the user can be removed. The web methods created for this service are removeFile and removeImage. Photo can be removed by resetting the datatype “pfield” of the photo table present in the database. For the file removal, entire file is deleted from the upload table.

Following service provide the most interesting feature of our EaVaMa system.

#### Exam service

This is the online exam service, where each paper is associated with 20 multiple choice questions (MCQs). Timer is associated with each paper. The answers can be manually submitted or it implicitly gets submitted once the timer is over. The evaluation of the answers provided by the student is done and thereby an analysis is provided by which the student can judge his/her performance. The analysis contains the list of total number of attempted questions, number of questions answered correctly, number of questions answered incorrectly, total marks obtained. The two operations for this service are “provideExamQuestions” and “evaluator”. The first web method provides the set of questions. The latter web method returns the number of questions correctly answered by the students. Thus the above mentioned services are used to implement our EVM system.

## IV. EXPERIMENTAL RESULTS

The challenges in project management and high failure rate of projects necessitate that the training of future project managers be improved [13]. Therefore, the use of *EaVaMa* for equipping students with the right skills set is one way of responding to this demand and improving the development of project managers. As mentioned before, the use of such a system has many benefits which include aiding the learning process and also supporting the learning process. *EaVaMa* also assists lecturers in developing model solutions for test questions and thus automating the process of manually developing solutions to such questions. Once it has been developed, the system will then be evaluated for its effectiveness in improving students’ learning experience with regard to earned value management concepts in project management.

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- The “EaVaMa System” provides a platform for online learning procedure. It can be used by the students of different schools, colleges, universities in the various part of the world.
- EaVaMa is boundary barrier independent & also lacks time constraint. The system facility is available 24\*7 a week. Even the facility is helpful for the professionals who cannot afford the time for in classroom teaching due to their busy schedule.
- Implementing the services for the building of the system provides a cleaner approach. Each service is associated with one or more functions and the webpages utilizes these functions. The services allows the most important aspect of coding i.e. Reuse.
- For a developing country like India, this online learning process is a new aspect. India is now progressing towards E-Governance and education is one of those important fields that will come under E-Governance. Proper steps like this ensure a brighter future.

## IV. CONCLUSION

We have implemented “EaVaMa System” provides a platform for online learning procedure. It can be used by the students of different schools, colleges, universities in the various part of the world. For a developing country like India, this online learning process is a new aspect. India is now progressing towards E-Governance and education is one of those important fields that will come under E-Governance. Proper steps will ensure a brighter future.

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