

# Design and Evaluate an Online Training Management System for Rural Information Communication Technology Trainees in Libya

Khaked Waregh<sup>a</sup>, Abdalmonem Tamtam<sup>b\*</sup>

<sup>a</sup>*Higher Institute for Comprehensive Careers, Nalut, Libya*

<sup>b</sup>*University of Al-Ghabal Al-Gharbi, Libya, Dublin City University, Dublin, Ireland*

<sup>a</sup>*Email: k\_waregh@yahoo.com*

<sup>b</sup>*Email: abdalmonem.tamtam2@mail.dcu.ie*

## Abstract

The role of Information and Communications Technology (ICT) in human development has received growing attention among development practitioners, policy makers, government and civil society in recent years due to the growing proliferation of the Internet, convergence in IT and telecommunications technologies and increasing globalization. Every year IT trainers are sent to train IT to the rural people. But it forms a major challenge because the Government organization, Non-Government Organization (NGO), volunteer IT trainer do not know which rural people have already been taught IT skills and if taught then which level of IT knowledge they have? To resolve these issues an online Training Management System for rural Information Communication Technology training will were designed and discussed in this paper.

The finding reported that, there are three different constituents and they are: convenience of the system, excellence of the content and the features of the interface, also the survey findings indicated a high level of satisfaction with the Online Training Management for rural ICT trainee.

**Keywords:** ICT; Rural Training; Training Management; Online System; Libya.

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\* Corresponding author.

## **1. Introduction**

ICT used in education at a particularly dynamic stage in Africa; new developments and announcements happening on a daily basis somewhere on the continent. ICT and Education in Africa will be updated in an iterative process over time based.

Libya boasts the highest literacy rate in the Arab world [1], and the UN's Human Development Index, which ranks standard of living, social security, health care and other factors for development, places Libya at the top of all African countries. Government reform plans in developing ICT infrastructure in Libya and incorporating ICT in education as key components in its overall development plans. Libya has intentions to be seen taking a leadership role on the African continent through sponsorship of major initiatives and projects, including those in the neighbouring countries of Chad, Niger, and Rwanda. That said, the challenges of poor existing infrastructure and a lack of skilled and ICT-equipped teachers is a great challenge to the current reform process.

The national policy for ICT in education was launched in 2005 and is mainly managed by the Ministry of Education and the Ministry of Vocational Training with the participation and support of other parties [2]. This is planned for the short term and there are some signs that the policy is being followed up and implemented.

Government will build and deploy to improve ICT infrastructure to the general public throughout the country. Human resource development in ICT was also given emphasis, to increase the supply of skilled and knowledge manpower to meet the demands for new sets of skills and competencies required. Efforts were also rolled out to foster local capabilities in creative content development [2].

It is a challenge to keep track of people trained and who would need more training. Though ICT organizations can keep trainee details manually but an Online Trainee Management System can keep details about the training and schedule the program. Then the trainer program director can suggest the trainer to conduct ICT training especially in rural area where there is a big gap of knowledge. And it is easy to find the information from the internet.

### ***1.1 Objective of the study***

The primary objective of this study is to develop a web based Trainee Management System, especially the objectives are:

- To design a requirement model of an Online Trainee Management System for ICT trainee.
- To build a prototype of Online Trainee Management System for ICT trainee.
- To test for usability of the prototype.

## **2. Related Works**

According to Markey and Atherton [3], Online Training and Practice Manual (ONTAP) have self-improvement

exercises with search formulations and explanations selected from the questions stored in the ONTAP file. Each exercise falls within the scope of interest of one of the 16 ERIC Clearinghouses. The ONTAP file is a subset of the ERIC data base consisting of RIE and CIJE citations for the 1975 ERIC file and 29 simple, moderate, or difficult search questions with answer sets. It was developed to allow searchers to evaluate their output by computing recall and precision scores of their results with the results of a "perfect search" or answer set. The appendices include 13 search save formulations of common search facets for "population level" and "tools" which can be accessed and exchanged between DIALOG workspaces by using the procedures that are outlined, and a comprehensive guide to DIALOG's ERIC data bases.

Rural areas (referred to as "the countryside") are large and isolated areas of a country, often with low population density. A "rural community" is a group of people living in an area that is in the country, away from a big town or city [4].

Meinel described a course management system for university lectures and lab courses, called LCMS, which started as a simple registration tool for students [5]. The problem was signing up for lab courses, examinations and student administration. LCMS has been developed into a powerful system, assisting the lecturer and the lab course administrator in the management of entire courses. LCMS tasks are ranging from course registration, student data administration, creation of course web pages, design and administration of exercises and test sheets, up to the design of certificates for successful course participation. LCMS can do student administration and can easily be adapted to any kind of course management. LCMS mainly focused on course registration are student data administration students may choose to take online training.

According to [6], determine information and communication technologies (ICT) effective integration for the rural community. It can accelerate the skills development of the project such as critical thinking, communication, collaboration and problem solving. Public Schools project and the Adopt-a-School program are introducing to implement a system wide computerization program. This support by governments, non-governmental organizations (NGOs), foreign governments and international aid donor agencies. The "Intel@ Teach" program, a global initiative of Intel Corporation also are introduce to achieve the target. It been introduce to provide training to teachers in how effective integrate by use of computers for existing curriculum in order to improve the students learning and they further achievement.

A study discussed the Microsoft Partners in Learning (PiL) which are created to utilize information and communication technology (ICT) for rural community in some South East Asian Nations (ASEAN) countries [7]. The researcher also determine the impact to the education communities through Microsoft Partners in Learning (PiL) program and the advantages by this program in driving integration in ASEAN countries. Manifested in Quality and standards of living style and also economic are affected by the two difference communities. The two communities are without and with access to the latest digital devices. The both communities troubling and significant the status of life and the country economic level. Many country, remains the need for ICT resources in they own local language which make easy to the citizen to learn [7]. By rote learning and a teacher-centered approach, the prevailing pedagogical practice is the best characterized which

apply in many public schools which are located in rural areas. The ICT learning based on ingrained pedagogical habits needs to be dislodged and conventional with cultural sensitivity. So that training provided by ICT development will be effective to the rural community.

According to [8], determine about the importance of grassroots ICT development for the community such as they need assessment. The main reason of ICT development is not only to provide information, but also for communication opportunities to the rural poor. They discuss, the identification and also the process of the content creation for ICT development can be help by the local universities which could play the role as facilitators. The product design for achieve the development goals id tele-center. Normative prescription while the expected progress of technology use to be a guild line is the tools of the development of ICT.

Another study discusses the materials and sources for the ICT development which are related or link to the project. Government embodied ICT in the policy which prioritized reach developed nation status of Malaysia. Malaysian Smart School Project and Telehealth Flagship Application are the initiatives to help the ICT project achieve the goals [9]. They contribute beneficiaries to improve global and knowledge based economy. The importance of indigenous and context-driven approaches of Projects is those local language mediums, meet local needs and demand-driven content become obvious. Factors of human such as social capital, capacity and best practice models determine leveraging collectivist the natural of rural society. It optimizes the advantages of ICT for the community.

The relations among the development and technology identified and discussed by [10]. ICT is an unprecedented opportunity to make new opportunities, services, or knowledge, which are available in underserved areas. The urban community and rural citizen feel the benefit from ICTs development. This is by few receiving methods. Some of the method are increase access to governmental and also quasi-governmental resources and they services. The latest opportunities to manufacture, design, and market their products. The citizen enhanced access to information and communication across large distances among each other's.

### **3. Methodology**

In this study we planned to come out a solution for Online Training Management in rural ICT trainee because this is the current focus in many countries thus makes its scope high

#### **3.1 Agile Methodology**

Agile methods as a response to these methods are developed. Many of these agile methods are to appeal to their bureaucratic ways of reaction engineering. These new methods much more useful process and not attempt to compromise between processes, providing just enough process to get a fair reward.

The result of all that agile methods engineering methods has some significant changes in force. The most immediate difference is that they are less document-oriented, usually for a certain task force on a small amount of documents. In many ways they are rather code-oriented one way that states that the body of the document

following the source code.

What is important about Agile methods adaptive and people oriented. In the absence of documentation is a symptom of two much deeper differences:

### 3.1.1 Agile methods are adaptive rather than predictive

Engineering methods tend to try to plan out a large part of the software process in great detail for a long span of time, this works well until things change. So their nature is to resist change. The agile methods, however, welcome change. They try to be processes that adapt and thrive on change, even to the point of changing themselves.

### 3.1.2 Agile methods are people-oriented rather than process-oriented

The goal of engineering methods is to define a process that will work well whoever happens to be using it. Agile methods assert that no process will ever make up the skill of the development team, so the role of a process is to support the development team in their work.

## 3.2 Steps in Agile Methodology

### Iteration

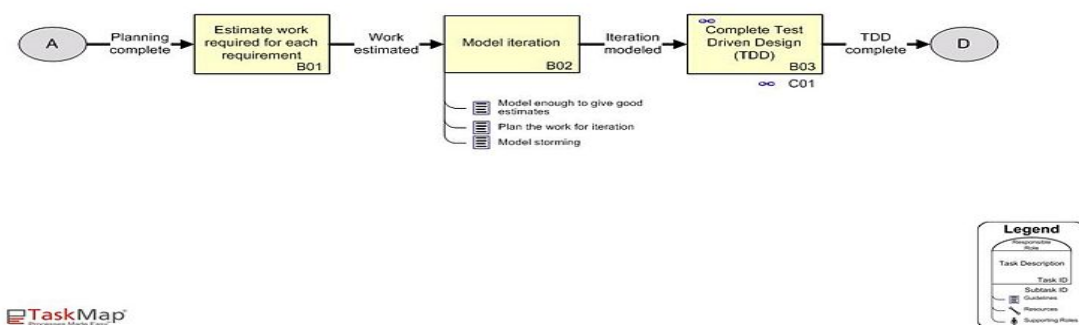
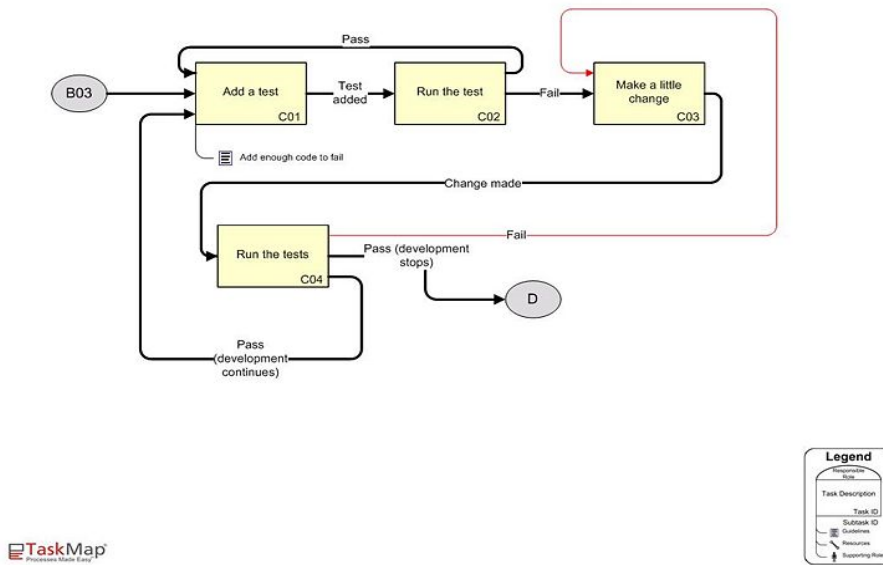


Figure 1: Iteration

1. Estimate the amount of work required for each requirement.
2. Create a model for iteration. The model should be complete enough to give good estimates and include a plan for the work required for iteration.
3. Complete Test Driven Design (TDD).

- In this phase we estimated our work load for rural ICT Training Management System and some of the design of the system for testing purpose.

**Test Driven Design (TDD)**



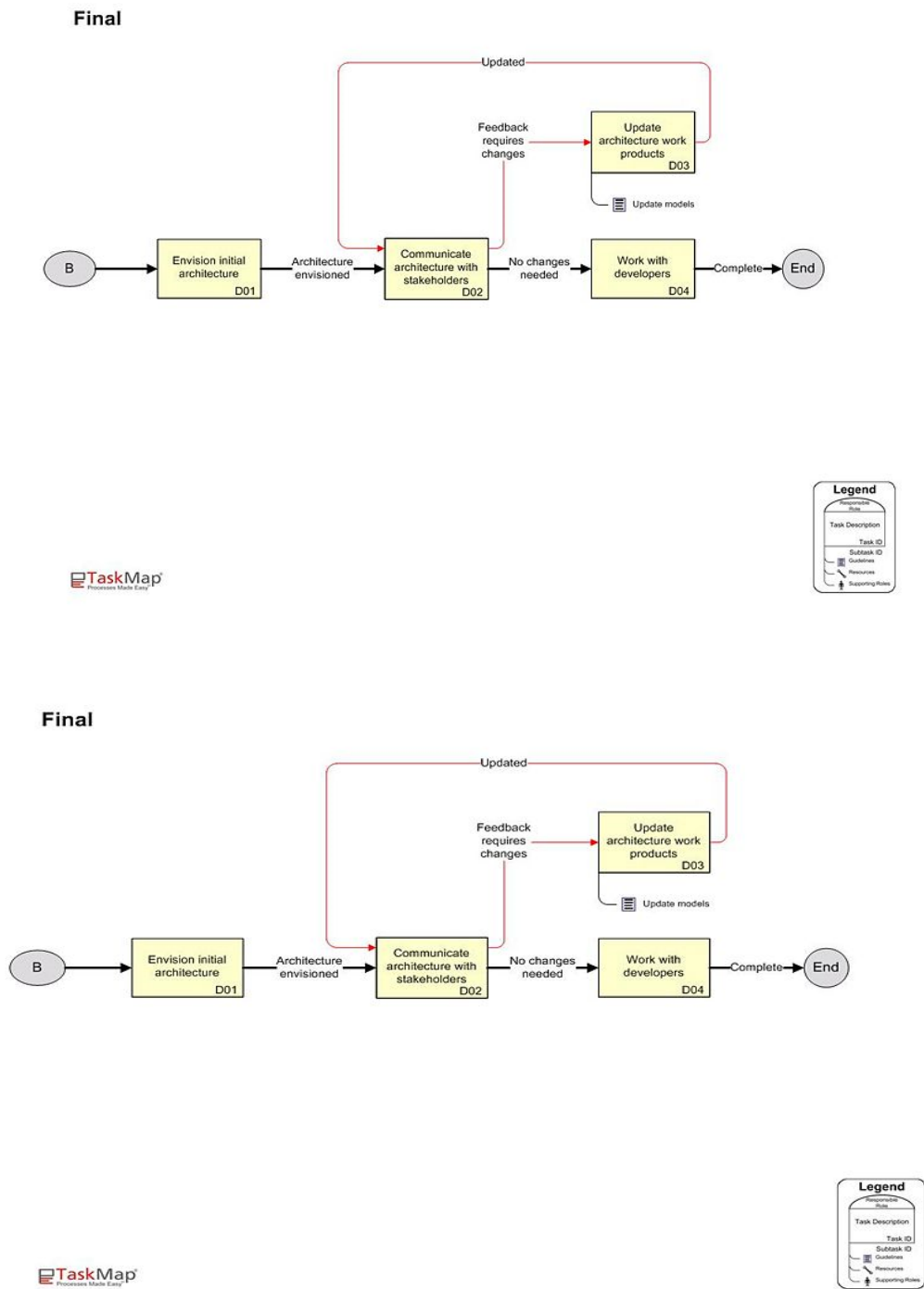
**Figure 2:** Test driven

- Add a test.
- Run the test. If the test passes go back to step 1. If the test fails continue to step 3.
- Make a little change to the code.
- Run the tests. If the test passes go back to step 3. If the test passes, but there are still development tests to complete return to step 1. If the test passes and development stops continue to the Final Stage.

We added the test such as user friendly or not, database working properly or not because the main goal lies on the proper database management.

- Envision the initial architecture.
- Communicate architecture with stakeholders. If feedback from stakeholders requires changes go to step 3. If no changes are needed continue to step 4.
- Update architecture work products and their models. Once everything has been updated go back to step 2.
- Work with developers to complete project.

In this stage we are almost done to complete our software development phase. We have shown our software interface to the stakeholder and we tested the usability of the system. In this phase we needed to update our deliverable so we repeat the step 3.



**Figure 3:** Final stage

## 4. System Design

### 4.1 Database Design

To design the database we have used SQL command in xampp software and also in PHP coding. The interface

given below will describe the database columns, type and operations:

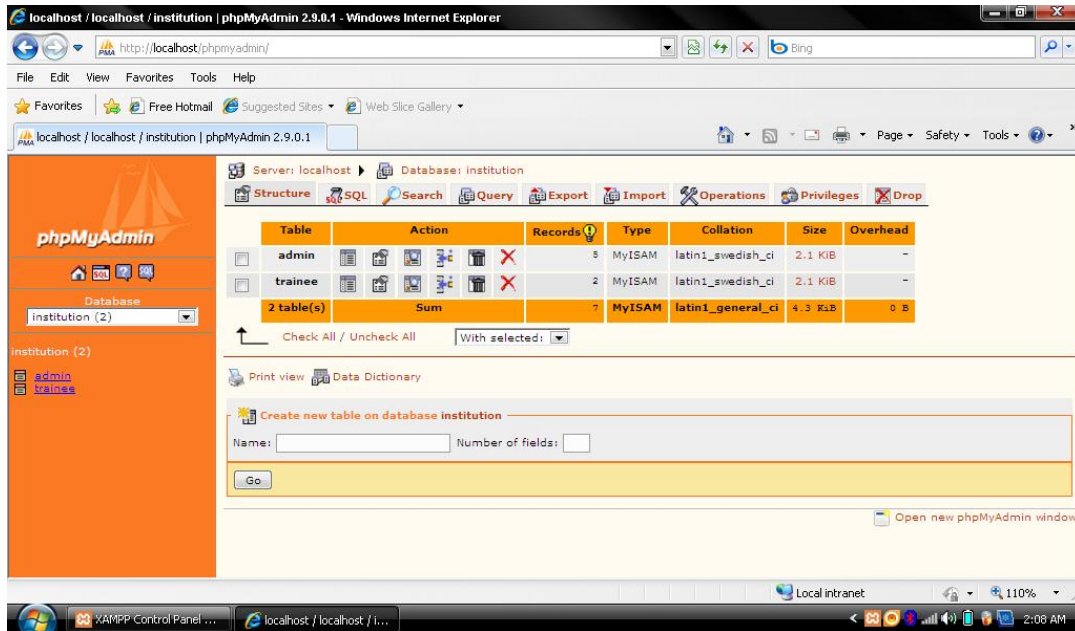


Figure 4: The database table in general

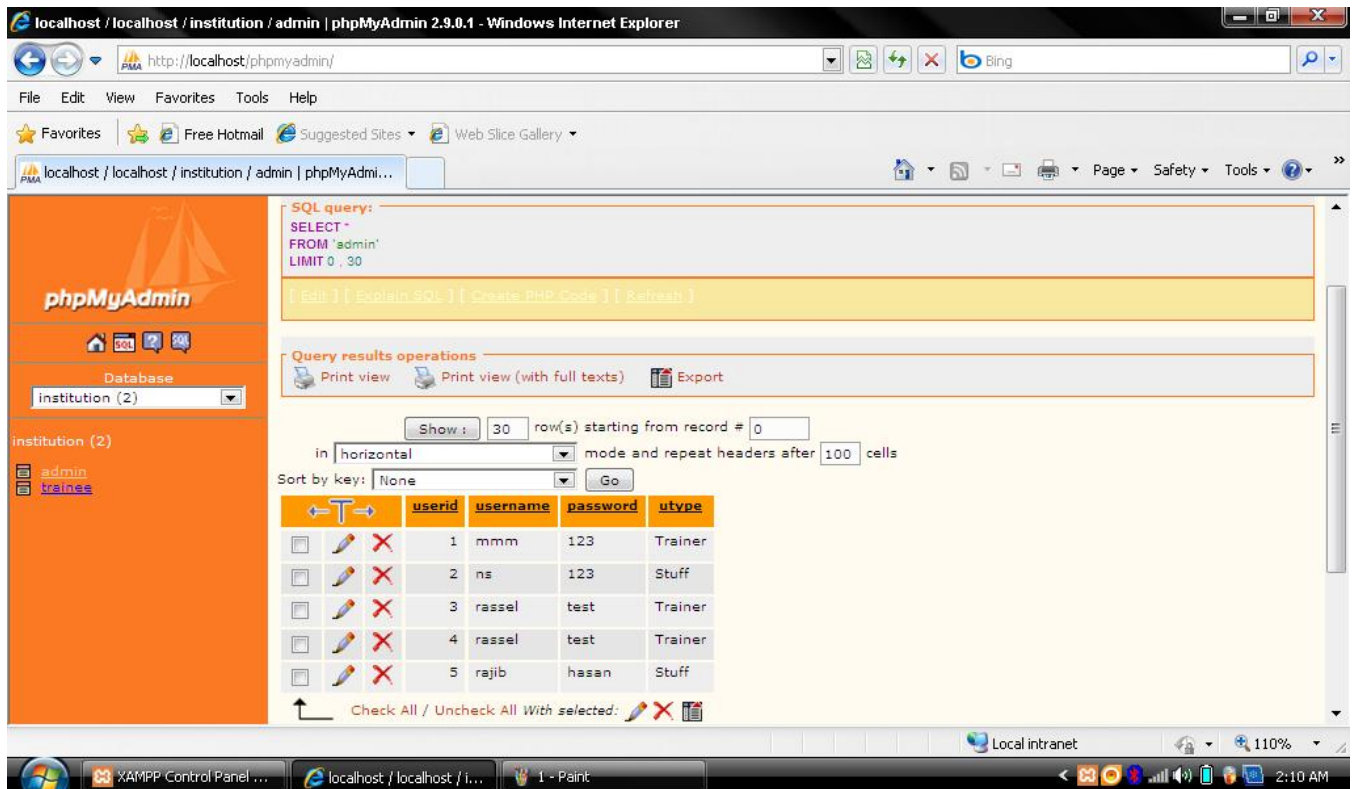


Figure 5: The database table for staff/ trainee



**4.2 List of requirements**

**4.2.1 Functional requirements**

**Table 1**

No.	Requirement ID	Requirement Description	Priority
<b>1.</b>	OTMS_01	Log in	
<b>2.</b>	OTMS_01_1	The Administrator can log-in into the system using his/here “user name” and “password”	M
<b>3.</b>	OTMS_01_2	The system shall detect the validate of “user name “ and “password”	D
<b>4.</b>	OTMS_01_3	The system will guide if log in password is forgotten	O
<b>5.</b>	OTMS_02	Manage User	
<b>6.</b>	OTMS_02_1	Admin can register for new trainee	M
<b>7.</b>	OTMS_02_2	Staff and Trainer can register the trainee	M
<b>8.</b>	OTMS_02_3	Admin can edit the registration details for staff, trainer and trainee	D
<b>9.</b>	OTMS_02_4	Admin and staff can view all the registered user details	O
<b>10.</b>	OTMS_03	Manage Site	
<b>11.</b>	OTMS_03_1	The Administrator can Update information by (edit ,delete, Add) on OTMS database tables	M
<b>12.</b>	OTMS_03_2	The system shall Update the Data Base after each operation doing by the Admin	D
<b>13.</b>	OTMS_03_3	The Administrator can generate and view the reports concerning the OTMS	O
<b>14.</b>	OTMS_04	Manage Program	
<b>15.</b>	OTMS_04_01	Training Programs	

16.	OTMS_04_01_1	Admin/ staff and trainer can add training program details	M
17.	OTMS_04_01_2	Admin/ staff and trainer can edit training program details	D
18.	OTMS_04_01_3	Admin/ Staff and Trainee can view the training program lists	D
19.	OTMS_04_02	Class management	
20.	OTMS_04_02_1	Staff/Trainer can manage class schedule	M
21.	OTMS_04_02_2	Staff/Trainer can view the class schedules	D
22.	OTMS_04_02_3	Trainee also can view class schedule	O
	OTMS_04_03	Lecture Notes	
23.	OTMS_04_03_1	Admin/ Staff and Trainer can add, edit, delete class notes	M
24.	OTMS_04_03_2	Admin/ Staff and Trainer can view the class notes	D
25.	OTMS_04_03_3	Trainee also can view class notes	D
	OTMS_04_04	Attendance List	
27.	OTMS_04_03_1	Admin/ Staff and Trainer can add, edit, delete attendance List	M
28.	OTMS_04_03_2	Admin/ Staff, trainee can view the attendance	D
	OTMS_05	Search Trainee	
30.	OTMS_05_1	Admin/ Staff and Trainer can search trainee details with their trainee Number	M
31.	OTMS_05_2	Admin/ Staff and Trainer can update trainee details	D
	OTMS_06	Log Out	
33.	OTMS_06_1	The Administrator/ staff, trainer can log-out from the system	M

34.	OTMS_06_2	The system will display a confirmation message about log out	O
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#### 4.2.2 Non-Functional requirement

**Table 2**

No.	Requirement ID	Requirement Description	Priorit y
	OTMS_06	Reliability Issues	
1.	OTMS_06-_1	The system should receive updated information every 15 minute.	M
2.	OTMS_06_2	If the system crash, it should behave perfectly normal when reloaded again	M
3.	OTMS_06_3	For a single user, the system should crash not more than once per 5 hours.	M
	OTMS_07	Usability Issues	
4.	OTMS_07_1	Security of data stored in system only can be access by certain authorize staff or admin in OTMS.	M
5.	OTMS_07_2	Time of system response to staff or admin should not exceed 4 minute.	M

#### 4.3 Use case diagram

Use case diagrams describe what a system does from the standpoint of an external observer. The emphasis is on what a system does rather than how.

Use case diagrams are closely connected to scenarios. A scenario is an example of what happens when someone interacts with the system.

A use case is a summary of scenarios for a single task or goal. An actor is who or what initiates the events involved in that task. Actors are simply roles that people or objects play.

##### 4.3.1 Use case diagrams are helpful in three areas

- Determining features (requirements). New use cases often generate new requirements as the system is analyzed and the design takes shape.
- Communicating with clients. Their notational simplicity makes use case diagrams a good way for

developers to communicate with clients.

- Generating test cases. The collection of scenarios for a use case may suggest a suite of test cases for those scenarios.

In our case we have three main Actors which are the admin, staffs and trainer about the main functionalities of admin are management of web site such as manage document by uploading, downloading deleting, Staff also can add, edit, delete class notes, class schedules and program details list.

#### 4.4 Use case: OTMS

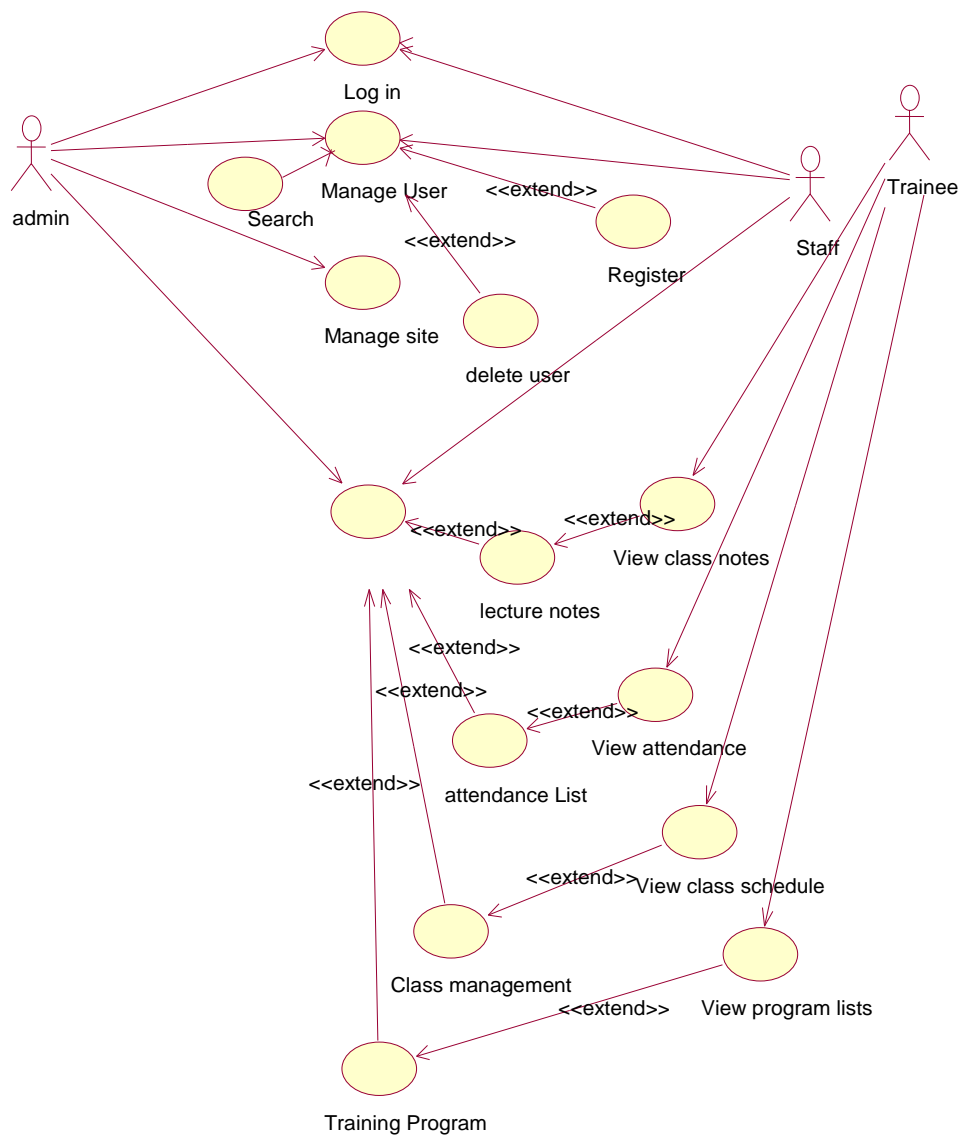


Figure 6: Use case OTMS

## **5. System Evaluation**

Evaluation using usability testing based on standardized tests after the interview in a closed room with equipment video. Testing with potential users can obtain more efficient feedback possible in a short time and available resources. Also, it is meaningless to ask people in a focus group to predict whether they would like something that I have not tested, so the only way to obtain valid data for users to experience the technology before advice sought, [11].

To evaluate this system, the prototype has been designed based on the brief interview conducted with 5 trainers to apprehend their view on the system, it had been reported that, there are three different constituents and they are: convenience of the system, excellence of the content and the features of the interface. Also a questionnaire were designed and distributed to 25 trainees as well. It contents 5 questions to measure trainees' satisfaction (1 unsatisfied 5 very satisfied) on the system. After questionnaire questions were analyzed we found the highest mean in number satisfactory level 4 and 5 which means that the users have accepted the system and satisfied with the usability of it.

## **6. Conclusion**

The paper reports on the design and evaluation of Online Training Management for rural ICT trainee. The evaluation of the system was based on a study involving sequence questions of survey for users' satisfaction of the system. Findings from this survey, plus other internal interview procedure with the trainers were used to have their views on convenience of the system, content of the system, and the features of the interface. Overall, the survey findings indicated a high level of satisfaction with the Online Training Management for rural ICT trainee.

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