

**UNIVERSITY OF NAIROBI**  
**SCHOOL OF COMPUTING AND INFORMATICS**

**KNOWLEDGE MANAGEMENT SYSTEM FOR KNOWLEDGE TRANSFER IN  
TECHNICAL INSTITUTIONS  
CASE STUDY: WOTE TTI**

**BY**  
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**A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS OF THE DEGREE OF MASTER OF SCIENCE IN COMPUTER SCIENCE  
OF THE UNIVERSITY OF NAIROBI.**

**APRIL, 2014.**

**Declaration**

This project report is my original work and has not been presented for any other award in any other University.

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**Dedication**

I dedicate this project to my beloved Dad and late Mom, sister, Charlyn and brothers, Charlesray, Nicholson and Kyalo for their continued support throughout the study period. God richly bless you.

## **Acknowledgement**

I first and foremost express my gratitude to the Almighty Lord the Monarch of all galaxies for the gift of life and His tender mercies upon me. I thank Dr. E. Opiyo for having been patient with me as he led me through the project work right from the proposal up to its completion. All the Lecturers, School of Computing and Informatics who imparted knowledge that has been of great relevance to this project. My family who have given me unmerited support both emotionally and financially especially my parents, brothers and sister. My friends who have been a great source of encouragement and given me profound support throughout the process especially Muthoka, William, Rabala, Veronica, Angela, Dan, Maina, Liz and Maureen. God richly bless you all!

## **ABSTRACT**

Lack of proper skills has led to mass failure in technical and business national examinations in the Technical Institutions. A committee, in its report, considered the problem of mass failure as due to lack or unavailability of resource materials in technical institutions. The rate at which technology is changing is not commensurate with the rate at which the human personnel imparting skills to the learners are being retrained or acquiring knowledge to fit aptly in their areas of specialization. This study involved carrying out a research in this field; designing and implementing a prototype system that will help in effective management and transfer of knowledge to students in technical institutions. The methodology used in developing the prototype was Rapid Application Development (RAD). It is an approach to systems development that includes method of development as well as software tools. RAD and prototyping shorten the time taken in the development process and involves more users in the process. The proposed system is expected to provide knowledge to learners in technical institutions as technology evolves most updated data is posted in the knowledge base to ensure that all the students have access to the most current information in different disciplines. This is geared towards helping the students to perform better in their examinations.

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*LIST OF ABBREVIATIONS*

*ABBREVIATION*

*DESCRIPTION*

SOLO.....	Structure of Observed Learning Outcome
EFA.....	Education For All
GoK.....	Government of Kenya
TVET .....	Technical Vocational and Entrepreneurship Training
KM .....	Knowledge Management
CE .....	Community Enterprise



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## 1.1 Background

Knowledge is an “Ideational construct (i.e. Conceptual rather than Physical) developed through the action of mind. It is a fluid mix of framed expertise, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates from and is applied in the minds of the knower “Davenport & Purasak, (1998).

Knowledge is acquired through learning and there are three types of learning as illustrated in the Bloom’s Taxonomy which was created under the leadership of educational psychologist Dr Benjamin Bloom (1956). This Taxonomy was intended to promote higher forms of thinking in education, such as applying, analyzing, synthesizing and evaluating, rather than just remembering facts which is commonly referred to as rote learning. The three types of learning which was identified by the committee lead by Dr. Benjamin Bloom they are as follows:

**Cognitive:** mental skills (*Knowledge*)

**Affective:** growth in feelings or emotional areas (*Attitude or self*)

**Psychomotor:** manual or physical skills (*Skills*)

This taxonomy of learning activities can be thought of as the purpose behind every learning process. By the end of every learning period, the learner should have acquired new skills, knowledge, and/or attitudes. Trainers often refer to these three categories as KSA (Knowledge, Skills, and Attitude).

An improvement of Bloom's Taxonomy was devised and it is referred to as Structure of Observed Learning Outcome (SOLO) taxonomy. This model has proved to be quite useful. It is a model that describes levels of increasing complexity in a learner's understanding of subjects Biggs, Collis (1982). It aids both trainers and learners in understanding the learning process.

Technical education is largely composed of learning of procedures of achieving given objectives. It can be best described as learning that involves mastering psychomotor skills. In learning psychomotor skills, one is required to co-ordinate the hands and the eye movements. This method of learning requires that the instructor and the learner to be actively involved. For

learning to be said to have taken place when learning psychomotor skills, the following are the steps that are taken:

Orientation and explanation (conceptualization) - At this level the instructor explains to the learner the reasons for learning the skills to be acquired, describes the desired outcome and explains any potential problem, common errors or any tricky areas likely to be encountered during the process. The instructor also strives to provide the learner with all knowledge required for the skill to be performed accurately. All the equipment required are also enumerated during this stage. Basically, it is at this stage that the learners are exposed to “what” to do and not necessarily “how” to do it.

Instructor “talk through” - The instructor organizes the learners in such way that all are able to watch him/her as he/she carries out the tasks necessary to accomplish the task. If the population of the class is so large, the instructor divides the class into smaller groups and does the demonstration as many times as the number of groups to ensure that no learner is disadvantaged. Thereafter the instructor starts the process as s/he narrates each step and maneuver s/he is performing. At this point the learner is able to ask questions or seeks any further clarification.

Learner “talk through” with coaching - The instructor invites a volunteer or points on one of the learners to perform the procedure explaining to the instructor every step. The instructor watches as s/he makes encouraging remarks like that’s good, that’s right, that’s a brilliant move among others.

Learner “talks through” without coaching - The learner is left to go through the process under very close supervision providing a comment at each step. Once the instructor is contented with the learner’s ability to perform the process, the instructor gives the learner an exercise relevant to the skill learned so as to practice and drill helping the learner to perfect the skill as time goes by. Ultimately the learner is given a project to undertake that requires that the learner uses a number of a combination of skills learned over duration of time.

The Education For All (EFA) 2000 Assessment Country Report notes that the provision of educational and training opportunities has been a standing objective of the Government of Kenya (GoK) since independence in 1963. Education has been considered by different stakeholders in the country as an important vehicle for socio-economic and political development. Education has, therefore, been seen as a fundamental strategy for human capital development and a crucial

vehicle for enhancing the quality of life. However, as Kenya approaches the 21<sup>st</sup> century, the county is faced with new challenges of meeting the public demand for education and training both as a human right and as an essential investment in the strive to attain the status of a newly industrialized country. These challenges point to the need for the education sector to properly play its role of developing needed skilled human resource.

Education and Training, highlights on the importance of matching skills to market demand as outlined in Vision 2030 Sessional paper (2012). Presently this is a big challenge at all levels. Many primary and secondary students who cannot proceed with formal education are absorbed by TVET institutions. This project strives to establish on the importance of a knowledge management system to aid in knowledge transfer in the Technical Institution.

## **COMPONENTS OF KNOWLEDGE MANAGEMENT SYSTEM**

The following are the components of knowledge management system:

Content - With regard to Education and Training organizations such as TVET systems, knowledge and skills is the sole commodity that is placed for sale. It is their core competency on which depend their survival and competitiveness. Therefore the knowledge presented in courses and training programs should be relevant, updated and easy to understand. It should match the demand of the knowledge Intensive workplace. The main education process of TVET system contain the delivery of concepts and theories in the traditional class rooms, followed by practical/hands-on exercise in the workshops and laboratories and ends with the supervision of the students' projects. Some TVET Institutes have linkages with Industries for apprenticeship in a bid to integrate the experiences of the two. Some have a dual training system and a lot more similar type of partnerships. *Dr. Hazrat Hussain (2009)*

Processes - As a process, KM is the art of bringing the right Knowledge to the right person at the right time in the right place. The process encompasses knowledge creation and acquisition, organization and storage, sharing and dissemination and application of the knowledge to processes to enable them deliver products and services meeting or exceeding the customer's expectations.

Infrastructure - Identifying, nurturing, and harvesting knowledge is a principal concern in the information age. The technology infrastructure adopted to support knowledge Management, should be according to the needs of the institution and not vice versa. The knowledge sharing

medium should be very carefully selected to fit the institution system needs, actual knowledge behaviour and of course, cost effectiveness.

Culture - Thus, knowledge management is the building foundation for creating knowledge based working culture faster and even more solid than the present one. The work culture must stimulate continuous improvements, continuous organizational learning, knowledge sharing, a high degree of openness, productive co-operation among employees and external parties so that synergy is created across traditional borders.

## **1.2 Problem Statement**

Many of the youths lack adequate training and hence they don't pass well in their examination and consequently lack appropriate skills. Jacob Omolo (*October 2012 FES Kenya Occasional Paper, No. 1 FES Kenya.*)

Inadequate training can be attributed to lack of flexible, effective knowledge transfer and delivery systems.

There are various ways of transferring knowledge to the learner namely:

- Teacher transfers knowledge acquired to the learner;
- Learners studying on their own and acquiring the knowledge through the following methods;
- Using the available materials in the libraries;
- Informally through interacting with experts like during attachments.

It has been observed that poor performance is due to lack of updated relevant resource materials.

## **1.3 Objectives**

The main objective is to design and develop a knowledge management system for knowledge transfer in Technical Institutions using the World Wide Web to avail resource materials as per the syllabus in technical curriculum to learners, teachers, publisher, curriculum developers, and examiners among others. The following are the specific objectives that are to be met by the end of the research:

- (a) To identify the existing knowledge management systems in the Technical Institutions in Makueni County.
- (b) To design a management system for knowledge transfer for Technical institutions that is accessible via the web.

- (c) To develop a prototype to implement the proposed knowledge management information system.

#### **1.4 Research Questions**

This research will endeavor to answer each of these questions:

- (a) Are there existing computerized knowledge management information systems in use in Technical Institutions?
- (b) Are there Institutions with knowledge management systems that are effective and are used by Technical students on the web?
- (c) Would knowledge management system be a preferred source of knowledge for the students and teachers in Technical Institutes?

#### **1.4 Research Justification**

It is widely believed that educational development would lead to a speed up in equitable wealth and income distribution, availability of skilled human power, better health outcomes, low crime rates, national unity and political stability among others. It is evident that the number of students who sit class eight and form four examinations don't all end up in secondary schools and Universities respectively. There is a big mass of them who end up in Technical institutions and there is a need of developing more technology oriented methods of knowledge acquisition. This will be aimed at:

- (a) Providing online resource material which otherwise would take long to be provided in printed media.
- (b) Develop a more learner centered digital learning resource material.
- (c) Rapid changes and resulting obsolescence of technologies have rendered existing knowledge and skills obsolete.

#### **1.5 Scope and Limitations**

The scope of the research will be confined to one Technical Institution in Makueni County. The limitation of the research will be on learning of psychomotor skills using modern technology.

#### **1.6 Expected contributions of the study**

The following are the expected contributions of the project to the society at large:

- (a) Knowledge management system to be used in promotion of learning;
- (b) Development of a prototype during the research;

- (c) Creation of conceptual models.
- (d) The research findings will reveal the possibility of the use of knowledge management in learning.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 INTRODUCTION**

Literature review section is aimed at making clear the theoretical context of the problem under investigation and how it has been studied by other scholars. This chapter reviews both practical and theoretical literature on knowledge management system for technical institutions in order to identify research gaps, form and justify the questions this research will endeavour to answer.

According to [www.dictionary.com](http://www.dictionary.com), knowledge is nothing but familiarity, awareness, or understanding gained through experience or study and management is the act, manner, or practice of managing; handling, supervision, or control. So any act or practice to handle your familiarities, understandings and awareness in a meaningful manner is knowledge management. Knowledge management is also concerned with finding new knowledge, propagate that knowledge and thus utilize it. Knowledge management (KM) has emerged from earlier buzzwords of computing like data processing, data management and information management. Online Journal of Distance Education (2007)

Knowledge is something which only humans can possess. People know things, computers can't know things. Traditionally in our schooling system knowledge is seen as a personal possession. Knowledge gives us the ability to take action. Knowledge is based on experience; it requires instruction, and it involves the application of theory or heuristics (either consciously or unconsciously). Peter Mikulecký, Mohammad Saeed Lodhi Conference on Mathematics and Computers in Business and Economics (2010 )

It is suggested that a more natural 'continual anytime anywhere learning approach' where students can learn when they are ready to learn and have need for the knowledge which is continually updating through knowledge instruments and networks. But not only processing and acquiring knowledge is a key to a modern learning approach, but also collaboration and community-based practice for knowledge and skills development are important success factors. Charles Zhao<sup>1</sup>, Christian Gütl<sup>2</sup>, Elizabeth Chang(2008)

Workers of the knowledge era will need new skills to learn, unlearn and relearn right throughout their lives. Their working lives will be in learning organizations, which are constantly renewing and reshaping themselves. The challenge to TVET Institutes will be to support teachers and learners to develop the skills and orientation needed to learn and function in knowledge based

learning communities. This is what Harper and Elich (2001) sees as to how TVET Institutes in providing education and training can adequately prepare learners for working in the new economy.

Knowledge is immanent as well as extant. It can be born and can die. It can also be owned, stored and categorized. All these characteristics give a notion that knowledge is an object that undergoes some processes and forms. This necessitates the application of management concept to knowledge. After all it is a prime mover of all productive processes, interactions and anticipations. Knowledge management is the process of acquisition and creation, storage and organization, sharing and dissemination and of course the application of knowledge. Karl Wiig, (1999). Knowledge Management (KM) is about getting the right knowledge to the right people at the right time through a collection of technologies, tools and philosophies. Petrash, (1996)

For a learning process to be complete, a number of stakeholders are involved in the facilitation of it. These stakeholders includes: Kenya Institute of Curriculum Development (KICD), Kenya National Examination Council (KNEC), Ministry of Higher Education Science & Technology (MOEST) and Publishers like Kenya Literature Bureau (KLB) among others. KICD is charged with the responsibility of developing and reviewing syllabi. The Technical Education syllabi takes too long to be reviewed just to cite one example the first edition of syllabus for Diploma in Information Technology was developed in the year 2001 and revised in the year 2008. Considering the dynamism of technology six years is such along time and hence the students trained between this period of first edition and second edition would not fit very well in the market.

Most of the students interviewed agreed that technical education would play a major role in realization of vision 2030 but their attitudes have been negatively influenced by the lack of focus and incentives on the part of the government to make technical education more interesting to learn. The respondents from technical colleges also alleged that though attachment was provided for in the curriculum, many of them hardly got a chance in a suitable or relevant firm.

## **2.2 Knowledge management in Kenya**

As the global economy fast transitions into a knowledge-based economy, there is need to develop a knowledge policy at the national as well as industry level to guide the various economic agents on knowledge management in Kenya. Effective knowledge management may

be an important source of achieving long term sustainable competitive advantage. The concept of knowledge management is now an integral part of the strategic management processes of a growing number of organizations, as knowledge is increasingly considered as an important business asset and knowledge management as a key differentiator between firms. The objective of this study was to determine the extent to which commercial banks in Kenya have adopted knowledge management as well as to determine the various knowledge management practices by these banks. The study used primary data collected through questionnaires with open and closed ended questions. The questionnaires were dropped at the respondents' banks and picked later. The study population comprised of all the 44 commercial banks in Kenya as at the time of study. Responses were received from 28 commercial banks, translating to 64% of the target population. The data collected was analyzed using descriptive statistics. The findings of the study revealed that most of the banks did not have a knowledge management strategy in place, despite the high level of appreciation of the concept of knowledge management. Consequently, most banks did not have the requisite organizational structures and resources for effective knowledge management. On-the- job training, particularly through social interaction and shared experience among organizational members, was the leading mode of developing, sharing and distributing knowledge. In addition, the use of e-mails, telephones, intranet, job rotation and one-to-one meetings, were important knowledge management practices. The most relevant modes of knowledge retention were through best practices, use of document management systems as well as employee retention strategies. Rono, Joash Cheruiyot (2011)

### **2.3 Knowledge Management Model in Geneva**

To build a solid base for the development of a practical model of knowledge management, in June 1995 the Swiss Forum for Organizational Learning and Knowledge Management at the University of Geneva was founded. This Forum is a platform for practitioners who consider knowledge a strategic resource and a central tool for protecting their competitiveness. One of the activities of the Forum has been to hold theme-oriented roundtables (organized by the Geneva Knowledge Group) addressing such knowledge-related topics as strategy, training, and global knowledge networks.

### **2.4 Integrated knowledge management model**

Alan Frost (2013) came up with an integrated knowledge management model whose major requirements are as follows:

- (a) Identification of needs;
- (b) Identification of knowledge resources;
- (c) Acquisition, creation, or elimination of knowledge related sources/processes/environments;
- (c) Retrieval, application and sharing of knowledge;
- (d) Storage of knowledge;

## **2.5 Knowledge as a Service model**

Knowledge as a service (KaaS) is an emerging concept that integrates knowledge management (KM), a knowledge organization, and knowledge markets. KaaS are programs that provide content-based (data, information, knowledge) as organizational outputs (e.g., advice, answers, facilitation), to meet person or external user wants or needs. KaaS are delivered through the knowledge markets as a cloud computing (CC) environment. In ensuring the services will be delivered to the right community of practice (CoP) at the right time in a proper manner, therefore there is a need of a system called knowledge management system (KMS), so that the KaaS can be well managed in a proper form by using the KM life cycle processes. These life cycle processes are including the knowledge acquisition, knowledge storage, knowledge dissemination and knowledge application. This paper presents the concept and its model for facilitating knowledge as a service (KaaS) in a KM system so that CoP can make use of the knowledge from service provider as organizational output for their referencing in the context of current best practice and lesson learnt especially related to the CC environment. By using this KMS model, the community who are engaged or connected to the cloud can be easily getting the KaaS as they are wanted or to be considered for the potential purposes in achieving their goal or mission statement. ICRIIS (2011)

## **2.6 An Integrated Knowledge Management Model for Community Enterprises in Thailand**

Jonjoubsong, Lanthom (2008) carried out a research that seeks to explore the characteristics, organizational culture and current knowledge management (KM) practice in a community enterprise (CE). Prae Pun - a hand weaving CE in the northeast rural area of Thailand - has typical CE characteristics - self-employed and collaborative management, and a home-based production system utilizing local resources and knowledge. The current KM practice of Prae Pun entails three processes: basic skill development, competence building and new knowledge creation through creation, capture, sharing, transferring, verification, utilization and codification. Significantly for this study, KM of Prae Pun focuses on organizational knowledge creation and

indigenous knowledge systems. The current KM of Prae Pun also has four other components. Its knowledge resources come from members, other villagers, other hand weaving groups, support organizations and markets. Most of the knowledge is tacit and indigenous. The operation and management systems determine the knowledge processes and provide supportive and incentive systems. The organizational culture and resources, including funding, social capital and appropriate technologies, also provide supportive and incentive systems. The resources are also the tools that facilitate the knowledge processes. The knowledge assets encompass actual assets - products, cloth designs, techniques, and operation and management systems - and competencies including members' skills and abilities, social capital, and shared values, which are not registered as intellectual properties but are in the forms of organizational memories. The traditional KM practice of Prae Pun can be possibly strengthened by integrating modern KM concepts, including knowledge resources from academic and government agencies, appropriate technologies to facilitate knowledge codification and knowledge transfer, extrinsic reward and incentive systems, and facilitators or consultants to enhance members' communities of practice (CoPs). The findings of this study and the KM model contribute to both CE development and further research on KM in a CE context and indigenous KM.

## **2.7 Wikipedia Encyclopedia.**

Wiki is a term that refers to a website or database developed collaboratively by a community of users, allowing any user to add and edit content. Pedia stands for knowledge. Wikipedia therefore is a database of knowledge developed collaboratively by a community of users, allowing any user to add and edit content. This database was formally launched on 15 January 2001 by Jimmy Wales and Larry Sanger, but its technological and conceptual underpinnings predate this. The concept of compiling the world's knowledge in a single location dates to the ancient Libraries of Alexandria and Pergamum, but the modern concept of a general-purpose, widely distributed, printed encyclopedia originated with Denis Diderot and the 18th-century French encyclopedists. The idea of using automated machinery beyond the printing press to build a more useful encyclopedia can be traced to Paul Otlet's 1934 book *Traité de documentation*; Otlet also founded the Mundaneum, an institution dedicated to indexing the world's knowledge, in 1910.

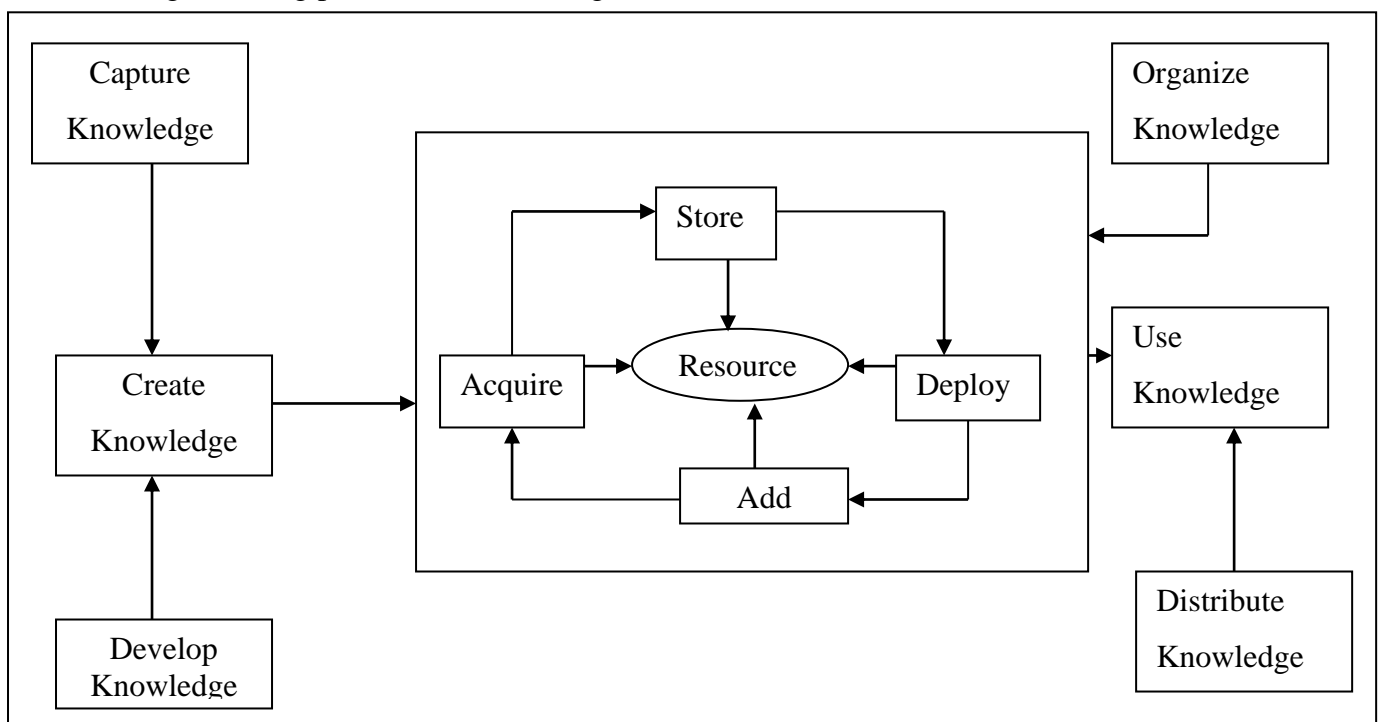
The earliest known proposal for an online encyclopedia was made by Rick Gates in 1993 but the concept of a free-as-in-freedom online encyclopedia was proposed by Richard Stallman in December 2000

An encyclopedia as defined by Oxford dictionary, is a compendium holding a summary of information from either all branches of knowledge or a particular branch of knowledge. “Encyclopedias are divided into articles or entries, which are usually accessed alphabetically by article name. Entries in it are longer and more detailed than those in most dictionaries. Generally speaking, unlike dictionary entries, which focus on linguistic information about words, encyclopedia articles focus on factual information to cover the thing or concept for which the article name stands.

## 2.8 Ikujurio Nonaka Model for knowledge Creation and Transfer

Nonaka's SECI (Socialization, Externalization, Combination, and Internalization) model first appeared in 1991 and attained recognition as a useful and rigorous approach to describing the ways knowledge is generated, transferred and re-created in organizations. In brief, the model incorporates the following:

- Two forms of knowledge (tacit and explicit)
- An interaction dynamic (transfer)
- Three levels of social aggregation (individual, group, and context)
- Four “Knowledge-creating” processes (socialization, externalization, combination and internalization). This model proposes that a "knowledge-creating company" consciously facilitates the interplay of tacit and explicit forms of knowledge. This is accomplished through systems and structures, and a corporate culture, which facilitate the interaction of four knowledge-creating processes, as in the figure below



## 2.9 Proposed System architecture

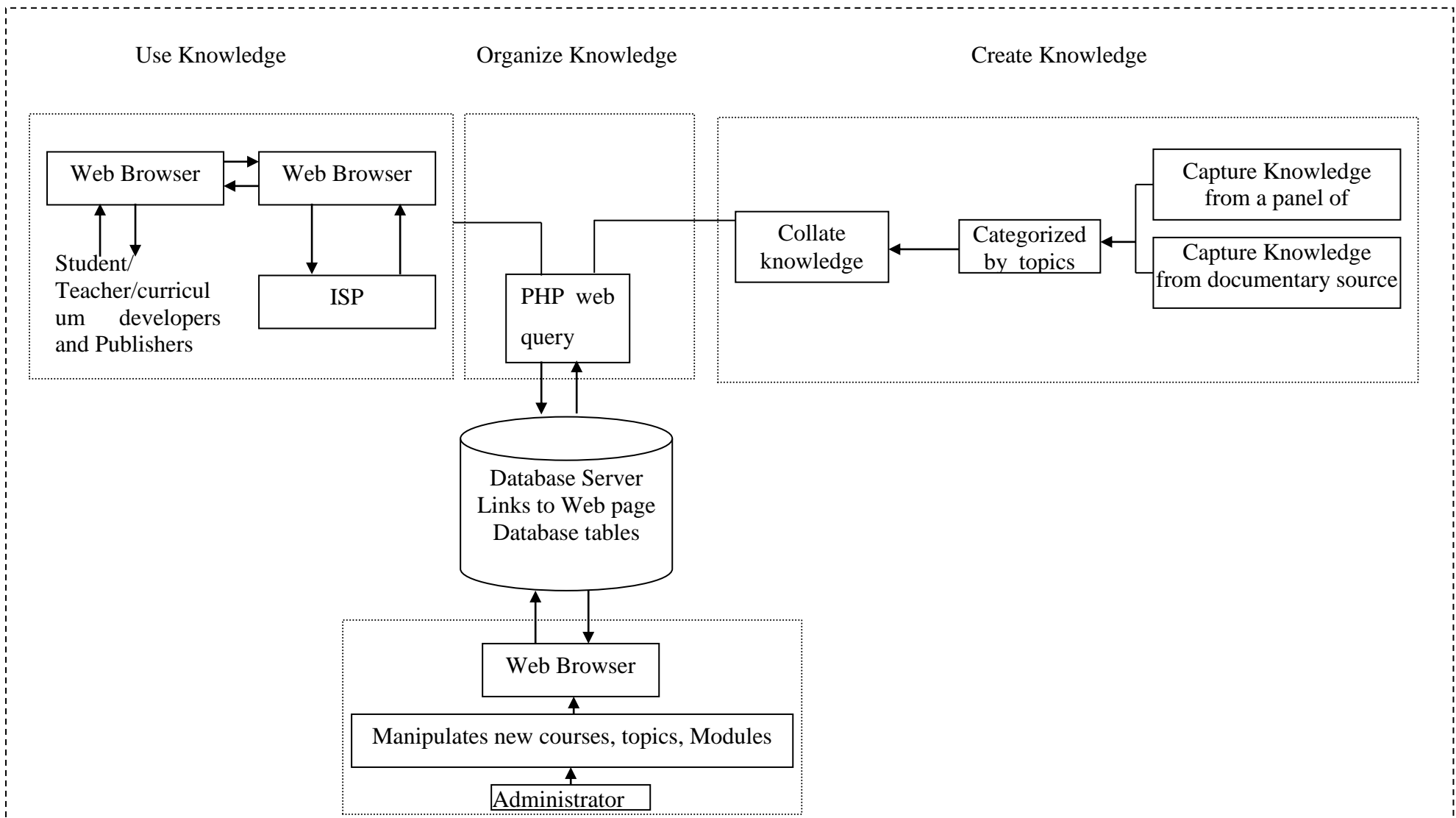


Figure 2.9.1

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Introduction**

The Oxford dictionary defines the term research as the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. Kothari (1985) also defined research methodology as the study of how research is done scientifically. Generally, research methodology is concerned with various steps recognized by a researcher in solving the research problem along with the logic behind them. Kent et al (1978) also stated that research is a systematic quest for knowledge that is characterized by disciplined inquiry. All these definitions are evident that for one to achieve meaningful solution to a practical or theoretical problem in any field of study, the research process needs to be conducted carefully.

In order to achieve all the objectives that are stated in chapter one, a number of activities were carried out.

### **3.2 Literature review.**

A lot of study was carried out in order to reveal all the challenges that exist in the existing systems of knowledge transfer in the Technical Institutions.

### **3.3 Methodology. Rapid Application Development (RAD)**

It is an approach to systems development that includes method of development as well as software tools. RAD and prototyping shorten the time taken in the development process and involves more users in the process.

#### **3.3.1 System specification**

During system specification all the system goals are identified, basic functionalities of the system are also identified and the resulting descriptor contains a name, a list of actions, list of relevant perceptions, inputs and outputs. It also provides a short description of interactions with other functionalities.

#### **3.3.2 Data Gathering**

The data gathering step allows the researcher to formulate research problem and justify the study. It helps establish the present knowledge management systems in use in the education sector, understand how they help the learners and investigate possible improves.



Some of the current systems' features of interest are:

- (i) Technologies used – what techniques are used in knowledge management, availing the knowledge to the learners and other stake holders.
- (ii) Procedures- the procedures used to collect and circulate the knowledge in a particular subject matter and the new technologies.
- (iii) Processes- to establish and comprehend the current methods involved in knowledge management.
- (iv) Inputs- in the event that there are systems in place, it will be of necessity to understand how data is inputted in the system.
- (v) Outputs- the format of the output would serve the purpose of design the output from the Knowledge Management System.
- (vi) Security- Knowledge Management Systems ought to have tight security mechanisms so that, valid knowledge is not interfered with by fraudulent user by maliciously altering the electronic content.

For the data gathering process to be reliable, a sample population will be drawn from the students and teachers of Wote Technical Training Institute.

### **3.4 Data Collection**

This term refers to a systematic gathering of data for a particular purpose from various sources, including questionnaires, interviews, observation, existing records, and electronic devices. More often than not, it is realized that data at hand is inadequate to enable one perform a meaningful research study and thus one needs to collect adequate relevant data to the problem area (Kothari 1985). Data collection is a process of gathering relevant data about a phenomenon which is under study. Data collection in this project will be done using research survey.

### **3.5 Questionnaires**

This is a method of data collection where the respondents are supposed to answer the questions at their own pace and without much pressure from researcher. It is a method which is quite popular, particularly in case of big numbers since it allows one to study broad aspects such as beliefs, attitudes, behaviour and characteristics of many people in an organization who may be affected by the existing system or proposed system Kendall and Kendall (2002).

The questionnaires will be designed and distributed to students and teachers at Wote Technical Training Institute. Other stakeholders may be involved in the study in future research. The questionnaires will be developed to capture relevant data covering the following areas:

- (a) Areas of specialization in Technical institutions.
- (b) Access to the internet by both the students and teachers.
- (c) Existing infrastructure to support use of a knowledge management system;
- (d) Existing sources of knowledge;
- (e) Existing knowledge management systems;

### **3.6 Data Recording and Analysis**

Human mind is limited to how much information it can store. Due to this fact it is necessary to record all the relevant data that the researcher gets in preparation for further study and analysis. Data recording therefore refers to the process of capturing important points during the study. This will be captured using Questionnaires - in the questionnaire spaces are provided for and the respondents are expected to fill their data in them which is later coded and analysed;

#### **3.6.1 Data Analysis**

The data collected will then be subjected to frequency and cross tabulation analysis in order to gain insights. This will be achieved through the use of descriptive statistical analysis technique with the aid of computer package such as Microsoft Excel worksheet. The results from the analyzed data will be visually displayed in form of graphs, charts and tables and from which insight will be got to be used as the basis for justifying the development of the Knowledge Management System.

##### **3.6.1.1 Analysis of responses.**

This section provides thorough analysis of the valid data obtained from the preliminary investigations contained in the questionnaires filled by respondents in Wote Technical Training Institute. In total 50 questionnaires were issued to the teachers and 42 were returned all of which were filled as expected.

##### **3.6.1.2 Demographic Details**

This section highlights on the respondents' general information which are used to predict whether the target group have the basic requirements necessary for sufficient use of proposed system. These include; Department, teaching subject, frequency of internet use and teaching experience.

### Respondents by department

Table 3.7.1.2.1 below is a summary of respondents by department. 50% of the respondents were from the engineering department and about 50% were from the business department. Not to be biased in any of the disciplines respondents were drawn from both engineering as well as business orientation in equal numbers.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Engineering	21	50	50	50
	Business	21	50	50	100
	<b>Total</b>	<b>42</b>	<b>100</b>	<b>100</b>	

Table 3.6.1.2.1 Responses by department

### Respondents by frequency of internet use

Table 3.6.1.2.2 below is a summary of respondents by frequency of use of internet. 19% of the respondents had no access to the internet, about 33% had 12 hours and above access of the internet daily, 47% had access once a week and 0% had access to the internet once a month. It was noted that the teachers who had access to the internet for 12 hours and more had been using the internet as a resource to get teaching materials. These same teachers given a knowledge management system information they need for teaching students would be a mouse button click away.

Internet access in hours		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	No access	8	19	19	19
	12 and Above	14	33	33	53
	Once a week	20	47	47	100
	Once a month	0	0	0	100
<b>Total</b>		<b>42</b>	<b>100</b>	<b>100</b>	

Table 3.6.1.2.2 Responses by frequency of internet use.

### 3.6.1.3 Sources of teaching materials

In this section, the study gives a comprehensive analysis on the different methods used in compiling teaching materials. The study summarizes the different methods used by teachers in compiling teaching resource materials and their inefficiencies.

### Respondents on Sources of teaching materials

The observation from many respondents revealed that most of the teachers use the available methods when preparing notes for the students. How to efficiently minimize the time spend in preparing lesson notes and making sure that the notes are updated reflecting the changes in emerging trends in different disciplines.

Method	Rating	Frequency	Percentage	Cumulative Percentage
Sources of teaching material	Text books	20	47	47
	Internet	16	38	85
	Periodicals	5	12	97
	Company reports	0	0	97
	Knowledge management system	1	3	100
Reason for use of the source.	Easily retrievable	11	26	26
	Easily Available	18	42	68
	Efficient	12	29	97
	Lack of other materials	1	3	100
Time taken to compile notes for a subject	Day	3	7	7
	Month	14	33	40
	Term	24	57	97
	Year	1	3	100
Number of subjects taught in a term	1	0	0	0
	2	11	26	26
	3	16	38	64
	4	15	36	100
Reasons for using knowledge management system	Never used	36	86	86
	Efficient	3	7	93
	Reliable	3	7	100
	Not reliable	0	0	100

Table 3.6.1.3 Responses on sources of teaching materials.

The following are some of the conclusions the study made based on the respondent table 3.6.1.2.3 include:

- 47% of the teachers use textbooks when compiling teaching materials. Though many also use other materials like the internet.
- 42% Use text books because they are easily available and not because the method is efficient.
- 57% of the respondents normally take a whole term compiling notes for one subject meaning that if they have several subjects, it takes them a lot of time compiling notes which would otherwise be used in preparing for the students.
- 86% of the respondents have never used a knowledge management system and the few who have used it felt that it was efficient and reliable.

### 3.6.1.4 Emerging trends

This section highlights on the respondents' general information concerning the use of availability of periodicals for the purposes of updating their notes. Considering that many Technical areas are technology driven it is of paramount importance to check on the new technologies which are in the market or are likely to be in the market in the near future. This is crucial because the students should get training that will enable them to fit in the job market aptly.

#### Use of periodicals

Table 3.6.1.4.1 is a summary showing respondent's frequency of use of periodicals to update their teaching materials to take care of all the emerging trends in their area of specialization.

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	A week ago	4	9	9	9
	Two weeks ago	0	0	0	9
	A month ago	6	15	15	24
	A year ago	4	9	9	33
	Never used	28	67	67	100

Table 3.6.1.4.Responses by department

### 3.6.1.5 General observation

This study sought to find out the methods used by teachers to compile teaching materials namely the teaching notes. From the data obtained, it was evident that most of the respondents used textbooks because they are easily available even though they are not efficient since they don't get updated

frequently and easily. Many respondents had no idea of a knowledge management system since it is not there in the technical training institutions. Some respondents also indicated that they were using the internet even though it takes them a lot of time trying to get the information they need. It was evident that a more efficient and reliable method is required and hence a knowledge management information system would come in handy.

### **3.7 System design**

In this phase more focus is on defining capabilities, internal events, plans and detailed data structures for the system. Much attention is focused on the system's ability to accomplish the task.

## CHAPTER FOUR: ANALYSIS, DESIGN AND IMPLEMENTATION OF PROTOTYPE

### 4.1 Introduction

Knowledge management system has been developed for the purposes of supporting knowledge transfer in technical institutions. Other methods of knowledge transfer have been exhaustively discussed in chapter two of this document. From the results analyzed in chapter three of this document, it was evident that there is an urgent need for a knowledge management system in the technical institutions.

### 4.2 System specification

At this stage a description of how the system works is done. It provides a documentation description of the design of the entire system highlighting on all goals of the system and the relevant interfaces among others.

#### 4.2.1 System goals

The main goal of the system is to understand what the system is made for. The overall goal of the system is basically to transfer knowledge to technical students and teachers, update the knowledge as soon as new technologies in a certain discipline are innovated and are availed in the web and revise the knowledge when need be. Figure 4.2.1.1 illustrates the system goals.

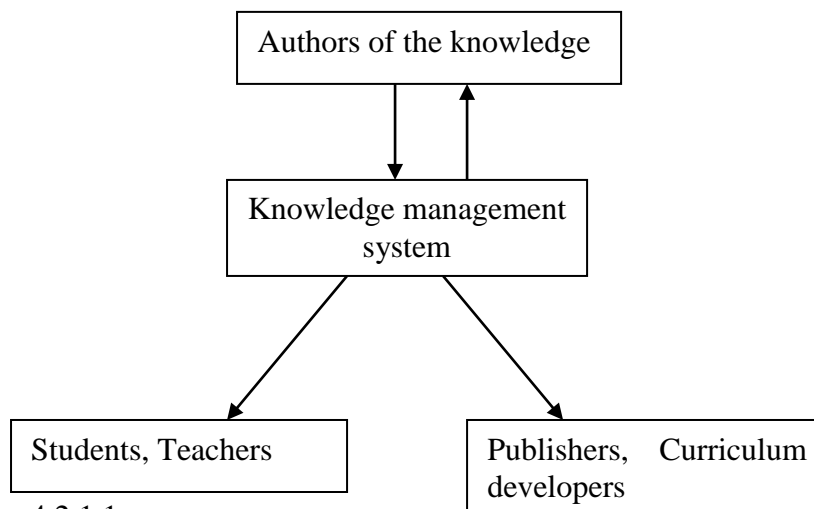


Figure 4.2.1.1

#### 4.2.2 Use Case Scenarios

Use case scenario defines the view of the use of a system from the users point of view. They capture the goal of an action, they trigger event that starts a process and then describes each step of the process including the inputs, outputs and errors.

**Use case 1:** The system administrator logs into the system for the purposes of updating and manipulating the information and also checking on whether the knowledge is well formatted on the webpage. Figure 4.2.1.2 illustrates the administrator use case.

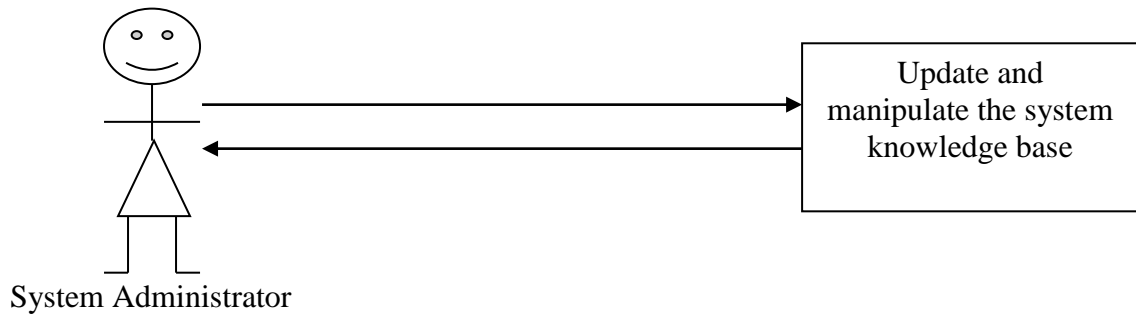


Figure 4.2.1.2

**Use case 2:** All the entities who intend to use the knowledge management system for the purposes of transfer of knowledge have to log on to the system so that they may gain access to the system information. These entities include students, teachers, publishers, curriculum developers among others. Figure 4.2.1.3 illustrates the users interaction with the system.

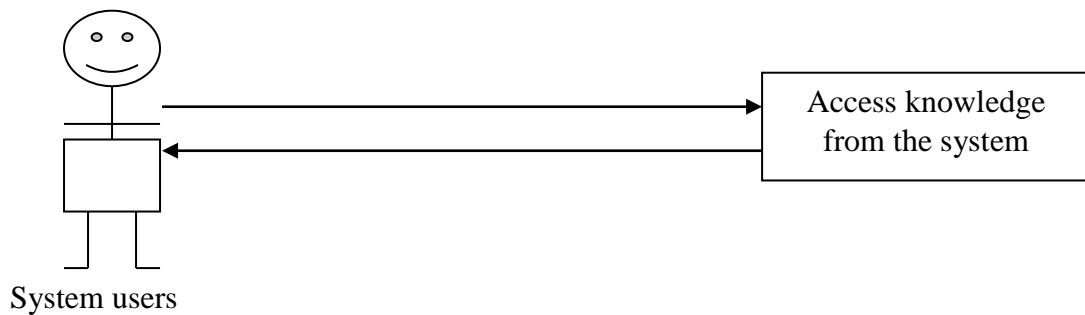


Figure 4.2.1.3

**Use case 3:** All the entities that create knowledge, in terms of topics and then the knowledge are organized in topics wise, collated and finally updated in the system. Figure 4.2.1.4 illustrates the authors interaction with the system.

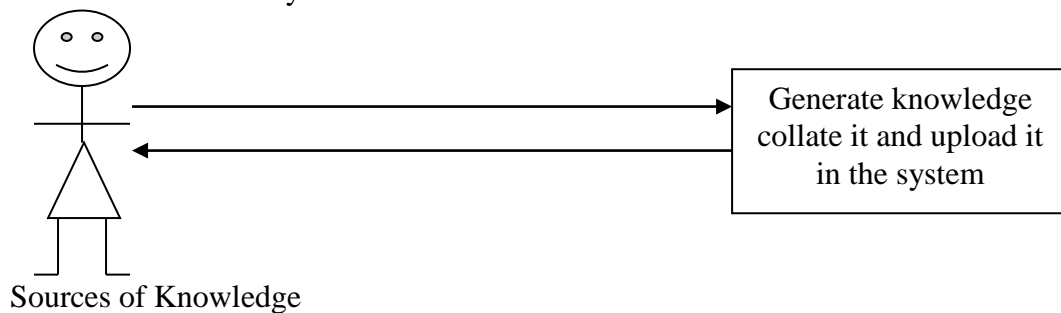


Figure 4.2.1.4

### 4.2.3 Identification of system interface to the environment

The system interface to the surroundings (environment) is categorized under the following:



#### **4.2.3.1 Actors**

The major actors in the knowledge management system are namely:

(a) System Administrator;

This forms part of the team of authors of the information system content. Collects data and populates the system ensuring that the data in the system is updated. All new innovations in a particular discipline are kept abreast with. When new innovation emerges with his panel they decide on whether the material is worth to be included in the knowledge base or not.

(b) Users;

There are different users of the information found in the system including:

- (i) Students – who can use the information from the system for the purposes of getting more information in a particular area of interest.
- (ii) Teachers – they use this resource for the purposes of getting lesson notes, setting examination and references for student’s further reading.
- (iii) Curriculum developers – when evaluating the right content for a particular subject they will also consider what is in electronic form.
- (iv) Publishers- these are the firms that are supposed to develop content for the curriculum in the country. The system will act as a reference to see what has been exhaustively done so that they don’t duplicate content which is already in existence.

#### **4.2.3.2 Percepts and Actions**

The percepts in the system include the information in a particular area of specialization, feedback the administrator gets from the users of the system and the information availed by searching the internet to the administrator. The action in this system would include sending queries to the internet to search for emerging issues in a particular subject.

#### **4.2.4 System functionalities.**

The system has a number of functionalities which help the user of the system to run the system smoothly. These functionalities include the following: administrator and user registration, information retrieval, information updation and search for new content in a particular area.

(a) Administrator login.

<b>Name</b>	Login
<b>Description</b>	Allow access of information to the user
<b>Messages</b>	Login successful
<b>Action</b>	Display the home page of the system
<b>Data used</b>	Data supplied by the system

(b) Information retrieval

<b>Name</b>	Information retrieval
<b>Description</b>	Display the information requested by the user
<b>Messages</b>	Search text box
<b>Action</b>	Display the search result

(c) Information updation

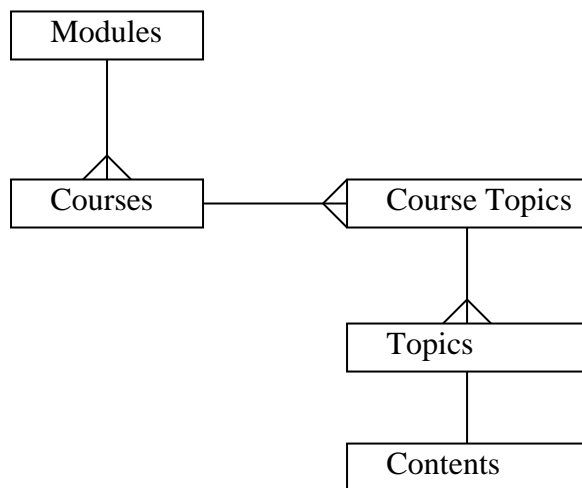
<b>Name</b>	Login
<b>Description</b>	Allow access of information to the author administrator
<b>Messages</b>	Login successful
<b>Action</b>	Display the home page of the system

(d) Search for new content

<b>Name</b>	Login
<b>Description</b>	Allow access of information to the administrator
<b>Messages</b>	Login successful
<b>Action</b>	Display the home page of the system

### 4.3 Architectural design

This section of the project gives a detailed description of the overall system view highlighting on the platform where the system operates from and relationship between topics. The following is the entity relationship diagram of the database.



#### **4.4 System documentation.**

The documentation was done progressively at each stage of the system development and finally compiled into technical and user manual generating this one comprehensive manual.

#### **4.5 Implementation of the system**

KMS prototype has been developed using open- source software. These software applications include Adobe Dream weaver, XAMPP Server, PHP, WordPad and DB Designer.

#### **4.6 System testing**

The system was tested using phrases from the Diploma in Information Communication Technology. These phrases were supplied to the system which in turn would search for information from the internet related to it and display correct findings.

## CHAPTER FIVE: RESULTS AND DISCUSSION.

### 5.1 Introduction

This study involved two aspects namely; a field study and development of a prototype and its implementation. Teachers and students were exposed to the system allowing them to interact with it to see whether they would get all the information they required. A questionnaire method of data collection was used to collect data from the students and teachers.

### 5.2 Results

The questionnaires were issued to 30 students undertaking Information Communication Technology and 4 computer teachers. The findings were as shown in table 5.2.1 below.

Method	Rating	Frequency	Percentage	Cumulative Percentage
Speed of accessing the topic needed	Slow	0	0	0
	Moderate	0	0	0
	High	30	100	100
Availability of materials on emerging issues	Adequate	30	100	100
	Inadequate	0	0	100
Accuracy on the available materials.	Accurate	30	100	100
	Inaccurate	0	0	0
Relevance of the materials	Relevant	30	100	100
	Irrelevant	0	0	100

Table 5.2.1

### 5.3 Discussion

It was evident that knowledge transfer through the use of a knowledge management system enabled students to take less time in retrieving information hence saving time. This is because the unit content was available at the same site.

Due to the use a team of panelist to prepare the content materials, it was evident that the information was adequate and accurate for respective courses.

The system is defined in such away that it can search the internet for emerging issues in different topics and hence making it possible to update the content every time there is new technology invented something not possible with the hard copy reference materials.

## **CHAPTER SIX: SUMMARY/CONCLUSION**

### **6.1 Achievements**

The following were achieved as per the objectives outlined in chapter two of this study:

*Objective 1: To identify the existing knowledge management systems in the Technical Institutions in Makueni County.*

Data was collected from the students and teachers of Wote Technical Training Institute located in Makueni County. This helped in understanding the existing knowledge management system in use in the institution.

*Objective 2: To design a knowledge management system for knowledge transfer for Technical institutions that is accessible via the web.*

The KMS was designed in preparation to the development of the prototype as shown in topic four.

*Objective 3: To develop a prototype and implement the proposed a knowledge management information system.*

The prototype was developed using open office software tested and implemented in the Institute. Feedback was collected through the use of a questionnaires to identify the appropriateness of the system.

### **6.2 Research contribution**

The study fully focused on identifying the methods used by teachers and students to acquire knowledge. The main contribution of this study is that it has provided an easier, faster, cheaper way of transferring knowledge to students in the technical Institutions through the use of knowledge management system. The technology enables the system to search from the internet effectively for emerging issues in various disciplines which would otherwise be difficult to get.

### **6.3 Recommendations / future work**

It is highly recommended that since this project work has only covered one unit in Diploma in Information Communication Technology:

- (a) The system should be expanded to accommodate other units in the technical syllabus and even other courses offered in the Technical Institutions.
- (b) Add more non academic information in the system to ensure that it avails all the required information by the students and teachers.
- (c) Employ latest software for the purposes of getting the best result from the system.
- (d) Implement the system using agents for efficiency.

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## Appendix 1

### Data Collection Tool for Availability of Resource Materials in Technical Institutions in Kenya to teachers

1. Which is your area of specialization?  
\_\_\_\_\_
2. Which subjects are you currently teaching?
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - (c) \_\_\_\_\_
  - (d) \_\_\_\_\_
3. Which year did you start teaching?  
\_\_\_\_\_
4. Where do you get your teaching notes from? Tick the correct sources.
  - [ a ] Text books
  - [ b ] Notes you used in College
  - [ c ] Internet
  - [ d ] Periodicals
  - [ e ] Annual company reports
  - [ f ] Knowledge management system
5. What reason prompts you to use the source stated in 4 above?
  - [ a ] Easily retrieved
  - [ b ] Easily available
  - [ c ] Efficient
  - [ d ] Lack of any other source
6. Do you have internet access?  
[ ] Yes                      [ ] No  
If yes, what kind of access? Tick the one applicable to you from the list below.
  - [ a ] 24 hours
  - [ b ] 12 hours
  - [ c ] Once in a week
  - [ d ] Once in a month



7. Have you ever used a knowledge management system to compile teaching notes?  
 Yes  No

If yes, rank it.

- [ a ] Efficient  
[ b ] Reliable  
[ c ] Not reliable  
[ d ] Not efficient

8. Which periodicals are available in your library?
- 

9. When was the last time you used a periodical to update your teaching notes?

- [ a ] A week ago  
[ b ] Two weeks ago  
[ c ] A month ago  
[ d ] A year ago  
[ e ] Never used a periodical for this purpose.

10. When using the Internet to get teaching materials, is it possible to find everything you want in one site?

- Yes  No

11. On average, how many subjects do you teach in a term?

- [ a ] 1  
[ b ] 2  
[ c ] 3  
[ d ] 4  
[ e ] Other specify. \_\_\_\_\_

12. How long does it take you to compile notes for one subject?

- [ a ] A day  
[ b ] A month  
[ c ] A term  
[ d ] A year

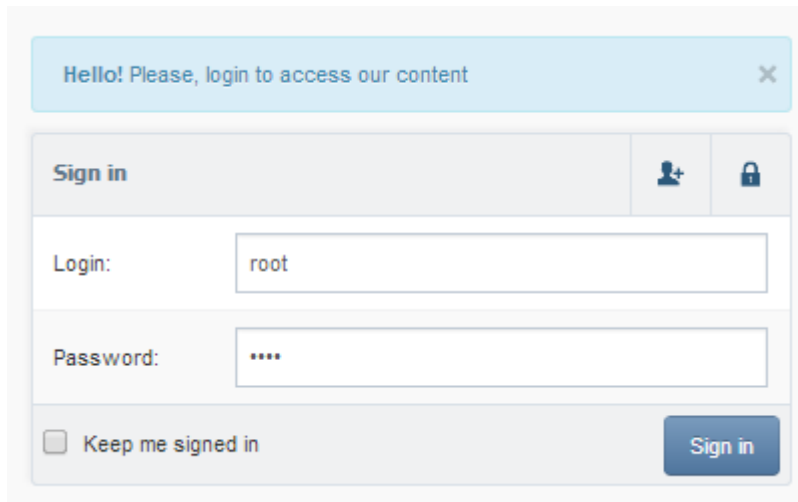
**Sample Questionnaire filled by the students.**

- a. Is the system easy to use?  
 Slow  Moderate  High
- b. Is the material available for the topic on emerging issues enough?  
 Adequate  Very adequate  Inadequate  Very inadequate
- c. Are the materials relevant to the topics in the syllabus?  
 Relevant  Very relevant  Irrelevant  Very irrelevant
- d. How accurate is the available material?  
 Accurate  Very accurate  inaccurate  Very inaccurate
- e. Is the system user friendly?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- f. Was the presentation of the course topics very clear?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- g. Was the interface flexible enough to allow for navigation?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- h. Did you manage to interact with the interface without much challenge?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- i. Are you confident to use this system again when preparing for the main examinations?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- j. Did the system allow you to study enough?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied
- k. Have you used a knowledge management information system before?  
 No  Yes
- l. Is the material available in the knowledge management better than what is in the books?  
 Satisfied  Very satisfied  Dissatisfied  Very Dissatisfied

## Appendix 2

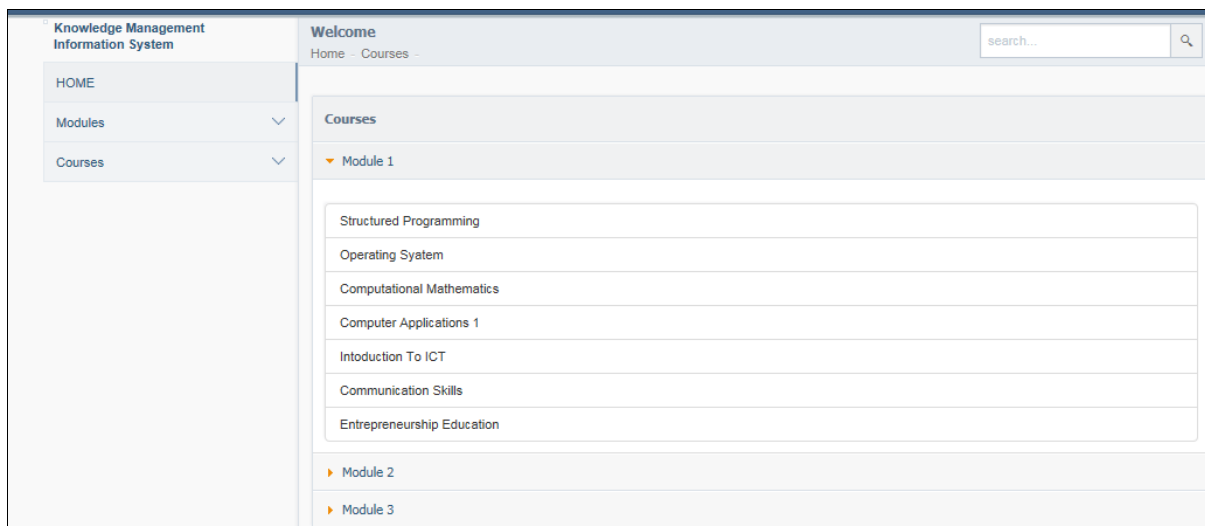
### Screen Shots

User login interface



A screenshot of a user login interface. At the top, a light blue banner contains the text "Hello! Please, login to access our content" with a close button (X) on the right. Below this is a "Sign in" section with a header bar containing a user icon and a lock icon. The form includes a "Login:" field with the text "root" and a "Password:" field with four asterisks. At the bottom left, there is a checkbox labeled "Keep me signed in". At the bottom right, there is a blue "Sign in" button.

Display of all the units taught to module one students.



A screenshot of a web application interface for "Knowledge Management Information System". The page title is "Welcome" and the breadcrumb is "Home - Courses". A search bar is located in the top right corner. The main content area is titled "Courses" and shows a list of units for "Module 1":

- Structured Programming
- Operating System
- Computational Mathematics
- Computer Applications 1
- Introduction To ICT
- Communication Skills
- Entrepreneurship Education

Below the list, there are expandable sections for "Module 2" and "Module 3". A left sidebar contains navigation links for "HOME", "Modules", and "Courses".

Display of all the chapters covered in structured programming.

The screenshot shows a web interface for a course titled "Structured Programming". At the top left, there is a breadcrumb trail: "Home - Courses -". To the right of the breadcrumb is a search bar with the placeholder text "search..." and a magnifying glass icon. Below the breadcrumb is a section titled "Content". Under "Content", there is a list of chapters. The first chapter, "CHAPTER 1: INTRODUCTION TO STRUCTURED PROGRAMMING", is expanded to show its sub-topics: "Definition of structured programming", "History of programming languages", "Programming paradigms", and "Hardware and software considerations for structured programming". The remaining chapters are listed with a right-pointing arrow icon: "CHAPTER 2: PROGRAM DEVELOPMENT AND DESIGN", "CHAPTER 3: Program Structure", "CHAPTER 4: Program Writing", "CHAPTER 5: Control Structures", "CHAPTER 6: Data Structures", "CHAPTER 7: Sub Programs", "CHAPTER 8: File Handling", and "CHAPTER 9: Program Documentation".

Display of the sign in dialog box for the administrator

The screenshot shows a sign-in dialog box. At the top, there is a light blue header bar with the text "Howdy! Please, don't tell anyone your password" and a close button (X). Below the header is a "Sign in" section. The "Sign in" section has a title "Sign in" on the left, a warning triangle icon, and a lock icon. Below the title are two input fields: "Login:" with the text "root" and "Password:" with four dots. At the bottom left of the "Sign in" section is a checkbox labeled "Keep me signed in". At the bottom right is a blue button labeled "Sign in".

## Display of administrator interface for manipulating courses, topics and module

The screenshot shows a dashboard with a top navigation bar containing a 'Logout' link, the title 'Dashboard', and a search box. Below the navigation bar is a 'Quick Actions' section with four buttons: 'New Module', 'New Course', 'All Courses', and 'All Chapters'. The main content area is titled 'Courses' and features a list of modules: 'Module 1', 'Module 2', and 'Module 3'. 'Module 3' is expanded to show a list of courses: 'Networking and Data Communication', 'Management information Systems', 'Principles of Management', and 'Internet Based Programming'.

## Interface for creating a new module

The screenshot shows the 'Module Details' form. It includes a 'Logout' link, the title 'Dashboard', and a search box. The form has a 'Clear form' button and a 'Module Name' input field with an asterisk indicating it is required. At the bottom, there are 'Hide prompts' and 'Submit' buttons.

## Interface for creating new courses in a particular module

The screenshot shows the 'Course Details' form. It includes a 'Logout' link, the title 'Dashboard', and a search box. The form has a 'Clear form' button and two required fields: 'Course Description' (text input) and 'Module' (dropdown menu with 'Select Module' as the current selection). At the bottom, there are 'Hide prompts' and 'Submit' buttons.



## Appendix 3

### Sample Code

#### Controllers

##### Admin controller

```
<?php if ( ! defined('BASEPATH')) exit('No direct script access
allowed');
class Admin extends CI_Controller {
    public function __construct()
    {
        parent::__construct();

        $this->load->model('chapters_model');
        $this->load->model('modules_model');
        $this->load->model('content_model');
        $this->load->model('courses_model');
    }

    function index()
    {
        $this->home();
    }

    function admin_login()
    {
        $data['page_elements'] = array(
            'title' => 'Admin Login',
            'default_theme' => FALSE,
            'page_content' => 'login',
            'content' => 'admin');

        $this->load->view('admin_template', $data);
    }

    function validate_credentials()
    {
        $this->load->model('owners_model');
        $query = $this->owners_model->validate_admin();

        if($query->num_rows ==1) //sucessful login
        {
            foreach($query->result() as $row)
            {
                $data = array(
                    'user_name'=>$row->user_name,
                    'id'=>$row->user_id,
                    'is_logged_admin' => TRUE
                );
            }

            $this->session->set_userdata($data);
            redirect(base_url().'admin/home');
        }

        else
        {
```

```

        $this->session-
>set_flashdata('message','Unknown Username/Password Combination');
        $this->admin_login();
    }
}
/*public function logout()
{
    $this->session->unset_userdata('is_logged_admin');
    $this->admin_login();
}*/

public function home()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $data['page_elements'] = array(
            'title' => 'Admin Home',
            'default_theme' => false,
            'page_content' => 'home',
            'content' => 'admin',
            'modules_list'=>$this->modules_model-
>GetModules(),
            'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}

public function addmoduleview()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $data['page_elements'] = array(
            'title' => 'New Module',
            'default_theme' => false,
            'page_content' => 'new_moduleView',

```



```

        'content' => 'admin',
        'modules_list'=>$this->modules_model-
>GetModules(),
        'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}
public function addmodule()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $query = $this->modules_model->AddModule();

        if($query)
        {
            $this->session-
>set_flashdata('error','Could not add module, Please try again');

            redirect(base_url().'admin/addmoduleview');

        }
        else
        {
            $this->session-
>set_flashdata('message','Success, Module added Successfully');
            redirect(base_url().'admin/home');

        }
    }
}

public function addcourseview()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {

```

```

        $data['page_elements'] = array(
            'title' => 'New Course',
            'default_theme' => false,
            'page_content' => 'addcourseview',
            'content' => 'admin',
            'modules_list'=>$this->modules_model-
>GetModules(),
            'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}

public function addcourse()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $query = $this->courses_model->AddCourse();

        if($query)
        {
            $this->session-
>set_flashdata('error','Could not add course, Please try again');

            redirect(base_url().'admin/addcourseview');

        }
        else
        {
            $this->session-
>set_flashdata('message','Success, Course added Successfully');
            redirect(base_url().'admin/home');

        }
    }
}

//course details
public function course($id)
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)

```

```

        {
            $this->session->
>set_flashdata('message','Please Login first');
            $this->admin_login();
        }
        else
        {
            $data['page_elements'] = array(
                'title' => 'New Course',
                'default_theme' => false,
                'page_content' => 'courses',
                'content' => 'admin',
                'course_id'=>$id,
                'modules_list'=>$this->modules_model->
>GetModules(),
                'course_chapters'=>$this->chapters_model->
>GetCourseChapters($id),
                'courses_list'=>$this->courses_model->
>GetCourses());
            $this->load->view('admin_template', $data);
        }
    }

    public function addchapterview($id)
    {
        $logged_admin = $this->session->
>userdata('is_logged_admin');

        if(!isset($logged_admin)|| $logged_admin!= true)
        {
            $this->session->
>set_flashdata('message','Please Login first');
            $this->admin_login();
        }
        else
        {
            $data['page_elements'] = array(
                'title' => 'New Course',
                'default_theme' => false,
                'page_content' => 'addchapterview',
                'content' => 'admin',
                'course_id'=>$id,
                'modules_list'=>$this->modules_model->
>GetModules(),
                'course_chapters'=>$this->chapters_model->
>GetCourseChapters($id),
                'courses_list'=>$this->courses_model->
>GetCourses());
            $this->load->view('admin_template', $data);
        }
    }

    public function addchapter($id)

```

```

        {
            $logged_admin = $this->session-
>userdata('is_logged_admin');

            if(!isset($logged_admin)|| $logged_admin!= true)
            {
                $this->session-
>set_flashdata('message','Please Login first');
                $this->admin_login();
            }
            else
            {
                $query = $this->chapters_model-
>AddChapter($id);

                if($query)
                {
                    $this->session-
>set_flashdata('error','Could not add chapter, Please try again');

                    redirect(base_url().'admin/addchapterview');

                }
                else
                {
                    $this->session-
>set_flashdata('message','Success, chapter added Successfully, you
may now add topics');
                    redirect(base_url().'admin/course/'.$id);

                }
            }
        }

        public function addtopicview($course_id)
        {
            $logged_admin = $this->session-
>userdata('is_logged_admin');

            if(!isset($logged_admin)|| $logged_admin!= true)
            {
                $this->session-
>set_flashdata('message','Please Login first');
                $this->admin_login();
            }
            else
            {
                $data['page_elements'] = array(
                'title' => 'New Course',
                'default_theme' => false,
                'page_content' => 'addtopicsview',
                'content' => 'admin',
                'course_id'=>$course_id,
                'modules_list'=>$this->modules_model-
>GetModules(),

```

```

        'course_chapters'=>$this->chapters_model-
>GetCourseChapters($course_id),
        'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}

public function addtopic($id)
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $query = $this->content_model->AddContent();

        if($query)
        {
            $this->session-
>set_flashdata('error','Could not add course content, Please try
again');

            redirect(base_url().'admin/addtopicview'.$id);

        }
        else
        {
            $this->session-
>set_flashdata('message','Success, course content added
Successfully, you may now add topics');
            redirect(base_url().'admin/course/'.$id);

        }
    }
}

public function edittopic($topic_id, $course_id)
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
}

```

```

else
{
    $data['page_elements'] = array(
        'title' => 'Edit Topic',
        'default_theme' => false,
        'page_content' => 'edit_topic',
        'content' => 'admin',
        'course_id'=>$course_id,
        'content_id'=>$topic_id,
        'modules_list'=>$this->modules_model-
>GetModules(),
        'course_chapters'=>$this->chapters_model-
>GetCourseChapters($course_id),
        'topic'=>$this->content_model-
>GetContent($topic_id),
        'courses_list'=>$this->courses_model-
>GetCourses());

    $this->load->view('admin_template', $data);
}

}

public function updatetopic($topic_id, $course_id)
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $query = $this->content_model-
>UpdateContent($topic_id);

        if($query)
        {
            $this->session-
>set_flashdata('message','Success, course content updated
Successfully, you may now add topics');

            redirect(base_url().'admin/course/'.$course_id);
        }
        else
        {
            $this->session-
>set_flashdata('error','Could not update course content, Please try
again');

            redirect(base_url().'admin/addtopicview/'.$course_id);
        }
    }
}

```

```

    }
}

public function searchlinks($topic_id, $course_id,
$pagenumber)
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
    else
    {
        $data['page_elements'] = array(
            'title' => 'Edit Topic',
            'default_theme' => false,
            'page_content' => 'links',
            'content' => 'admin',
            'course_id'=>$course_id,
            'content_id'=>$topic_id,
            'page_number' => $pagenumber,
            'modules_list'=>$this->modules_model-
>GetModules(),
            'course_chapters'=>$this->chapters_model-
>GetCourseChapters($topic_id),
            'topic'=>$this->content_model-
>GetContent($topic_id),
            'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}

public function logout()
{
    $this->session->unset_userdata('is_logged_admin');
    $this->session->unset_userdata('is_logged_user');
    $this->home();
}

public function all_chapters()
{
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if(!isset($logged_admin)|| $logged_admin!= true)
    {
        $this->session-
>set_flashdata('message','Please Login first');
        $this->admin_login();
    }
}

```

```

    }
    else
    {
        $data['page_elements'] = array(
            'title' => 'All Chapters',
            'default_theme' => false,
            'page_content' => 'all_chapters',
            'content' => 'admin',
            'modules_list'=>$this->modules_model-
>GetModules(),
            'results_list'=>$this->content_model-
>SearchContent(),
            'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('admin_template', $data);
    }
}
?>

```

## Courses controller

```

<?php if ( ! defined('BASEPATH')) exit('No direct script access
allowed');
class Courses extends CI_Controller {
    public function __construct()
    {
        parent::__construct();

        $this->load->model('chapters_model');
        $this->load->model('modules_model');
        $this->load->model('content_model');
        $this->load->model('courses_model');
    }
    function index()
    {
        $this->home();
    }
    public function home()
    {
        $logged_user = $this->session-
>userdata('is_logged_user');
        $logged_admin = $this->session-
>userdata('is_logged_admin');

        if($logged_admin == true || $logged_user == true)
        {
            $data['page_elements'] = array(
                'title' => 'KMIS',
                'load_side'=>true,
                'default_theme' => false,
                'page_content' => 'home',

```



```

        'content' => 'site',
        'modules_list'=>$this->modules_model-
>GetModules(),
        'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('site_template', $data);
    }
    else
    {

        $this->session-
>set_flashdata('message','Please Login first');
        redirect(base_url().'welcome/home');
    }
}

public function course_details($id)
{
    $logged_user = $this->session-
>userdata('is_logged_user');
    $logged_admin = $this->session-
>userdata('is_logged_admin');

    if($logged_admin == true || $logged_user == true)
    {
        $data['page_elements'] = array(
            'title' => 'KMIS',
            'load_side'=>true,
            'default_theme' => false,
            'page_content' => 'course',
            'content' => 'site',
            'course_id'=>$id,
            'modules_list'=>$this->modules_model-
>GetModules(),
            'course_info'=>$this->courses_model-
>GetCourse($id),
            'course_chapters'=>$this->chapters_model-
>GetCourseChapters($id),
            'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('course_template', $data);
    }
    else
    {

        $this->session-
>set_flashdata('message','Please Login first');
        redirect(base_url().'welcome/home');
    }
}

public function topic($topic_id, $course_id)
{

```

```

        $logged_user = $this->session-
>userdata('is_logged_user');
        $logged_admin = $this->session-
>userdata('is_logged_admin');

        if($logged_admin == true || $logged_user == true)
        {
            $data['page_elements'] = array(
                'title' => 'KMIS',
                'load_side'=>true,
                'default_theme' => false,
                'page_content' => 'topic',
                'content' => 'site',
                'course_id'=>$course_id,
                'content_id'=>$topic_id,
                'modules_list'=>$this->modules_model-
>GetModules(),
                'course_info'=>$this->courses_model-
>GetCourse($course_id),
                'course_chapters'=>$this->chapters_model-
>GetCourseChapters($course_id),
                'topic'=>$this->content_model-
>GetContent($topic_id),
                'previous'=>$this->content_model-
>get_previous($topic_id, $course_id),
                'next'=>$this->content_model-
>get_next($topic_id, $course_id),
                'courses_list'=>$this->courses_model-
>GetCourses());

            $this->load->view('course_template', $data);
        }
        else
        {
            $this->session-
>set_flashdata('message','Please Login first');
            redirect(base_url().'welcome/home');
        }
    }

    public function search()
    {
        $logged_user = $this->session-
>userdata('is_logged_user');
        $logged_admin = $this->session-
>userdata('is_logged_admin');

        if($logged_admin == true || $logged_user == true)
        {
            $data['page_elements'] = array(
                'title' => 'Search results for: '.$this-
>input->post('keyword'),
                'keyword'=>$this->input->post('keyword'),
                'load_side'=>true,

```

```

        'default_theme' => false,
        'page_content' => 'search_results',
        'content' => 'site',
        'modules_list'=>$this->modules_model-
>GetModules(),
        'results_list'=>$this->content_model-
>SearchContent(),
        /*'course_info'=>$this->courses_model-
>GetCourse($course_id),
        'course_chapters'=>$this->chapters_model-
>GetCourseChapters($course_id),
        'topic'=>$this->content_model-
>GetContent($topic_id),*/
        'courses_list'=>$this->courses_model-
>GetCourses());

        $this->load->view('site_template', $data);
    }
    else
    {

        $this->session-
>set_flashdata('message','Please Login first');
        redirect(base_url().'welcome/home');
    }
}

    public function searchlinks($topic_id, $course_id,
    $pagenumber)
    {
        $logged_user = $this->session-
>userdata('is_logged_user');
        $logged_admin = $this->session-
>userdata('is_logged_admin');

        if($logged_admin == true || $logged_user == true)
        {
            $data['page_elements'] = array(
                'title' => 'Edit Topic',
                'default_theme' => false,
                'load_side'=>true,
                'page_content' => 'links',
                'page_number' => $pagenumber,
                'content' => 'site',
                'course_id'=>$course_id,
                'content_id'=>$topic_id,
                'modules_list'=>$this->modules_model-
>GetModules(),
                'course_chapters'=>$this->chapters_model-
>GetCourseChapters($topic_id),
                'topic'=>$this->content_model-
>GetContent($topic_id),
                'course_info'=>$this->courses_model-
>GetCourse($course_id),

```

```

        'courses_list'=>$this->courses_model->GetCourses());
    }
    $this->load->view('course_template', $data);
}
else
{
    $this->session->set_flashdata('message','Please Login first');
    redirect(base_url().'welcome/home');
}
}
?>

```

## Models

### Chapters model

```

<?php
class Chapters_model extends CI_Model {
    function AddChapter($id) {
        $data = array(
            'chapter_description'=> $this->input->post('chapter_description'),
            'chapter_number'=>$this->input->post('chapter_number'),
            'course_id'=> $id
        );
        $this->db->insert('course_chapters', $data);
    }

    function GetChapter($id)
    {
        $sql = "SELECT courses.course_description,
modules.module_name , course_chapters.chapter_description
FROM modules, courses, course_chapters
WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND
course_chapters.chapter_id =".$id.";
        $query = $this->db->query($sql);
        return $query->result();
    }

    function UpdateChapter($id)
    {
        $course_name = $this->input->post('chapter_description');
        $sql = "UPDATE course_chapters
SET
course_chapters.chapter_description='".$course_name.'"
WHERE course_chapters.chapter_id
=".$id.";
        $query = $this->db->query($sql);
    }
}

```

```

        return $query->result();
    }

    function GetCourseChapters($id)
    {
        $sql = "SELECT courses.course_description,
modules.module_name, course_chapters.chapter_description,
course_chapters.chapter_number, course_chapters.chapter_id
                FROM modules, courses, course_chapters
                WHERE modules.module_id=courses.module_id
AND course_chapters.course_id =".$id."";
        $query = $this->db->query($sql);
        return $query->result();
    }

    function DeleteChapter($id)
    {
        $sql = "DELETE FROM course_chapters
                WHERE course_chapters.chapter_id
=".$id."";
        $query = $this->db->query($sql);
        return $query->result();
    }

}
?>

```

## Content model

```

<?php
class Content_model extends CI_Model {
    function AddContent() {
        $data = array(
            'content_heading'=> $this->input-
>post('content_heading'),
            'content'=> $this->input->post('content'),
            'chapter_id'=>$this->input->post('chapter_id')
        );
        $this->db->insert('course_content', $data);
    }

    function GetContent($id)
    {
        $sql = "SELECT courses.course_description,
modules.module_name , course_chapters.chapter_description,
course_content.content_heading, course_content.content,
course_chapters.chapter_id
                FROM modules, courses, course_chapters,
course_content
                WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND
course_content.chapter_id=course_chapters.chapter_id AND
course_content.content_id =".$id."";
        $query = $this->db->query($sql);
    }
}

```

```

        return $query->result();
    }

    function UpdateContent($id)
    {
        $content = $this->input->post('content');
        $heading = $this->input->post('content_heading');
        $sql = "UPDATE course_content
                SET
course_content.content='".$content."' ,
course_content.content_heading='".$heading."'
                WHERE course_content.content_id
='".$id.'";

        $query = $this->db->query($sql);
        return $query;
    }

    function GetChapterContents($id)
    {
        $sql = "SELECT courses.course_description,
modules.module_name , course_chapters.chapter_description,
course_content.content_heading, course_content.content,
course_content.chapter_id, course_content.content_id
                FROM modules, courses, course_chapters,
course_content
                WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND
course_content.chapter_id=course_chapters.chapter_id AND
course_content.chapter_id='".$id.'";
        $query = $this->db->query($sql);
        return $query->result();
    }

    function DeleteContent($id)
    {
        $sql = "DELETE FROM course_content
                WHERE course_content.content_id
='".$id.'";

        $query = $this->db->query($sql);
        return $query;
    }

    function SearchContent()
    {
        $sql = "SELECT courses.course_description,
modules.module_name , course_chapters.chapter_description,
course_content.content_heading, course_content.content,
course_content.content_id, courses.course_id
                FROM modules, courses, course_chapters,
course_content
                WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND
course_content.chapter_id=course_chapters.chapter_id AND
course_content.content LIKE '%" . $this->input->post('keyword') . "
%'";
    }

```

```

        $query = $this->db->query($sql);
        return $query->result();
    }

    function get_next($id, $cos)
    {
        $sql = "SELECT course_content.content_id,
courses.course_description, modules.module_name ,
course_chapters.chapter_description, course_content.content_heading,
course_content.content, courses.course_id
                FROM modules, courses, course_chapters,
course_content
                WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND
course_content.chapter_id=course_chapters.chapter_id AND
course_chapters.course_id = ".$cos." AND course_content.content_id >
".$id."
                ORDER BY course_content.content_id LIMIT
1;";

        $db = new PDO('mysql:host=localhost;dbname=abkms',
'root', '');
        $stmt = $db->query($sql);
        if($stmt)
            $id = $stmt->fetchColumn(0);
        if ($id !== false)
        {
            return $id;
        }
    }
    function get_previous($id, $cos)
    {
        $sql = "SELECT course_content.content_id,
courses.course_description, modules.module_name ,
course_chapters.chapter_description, course_content.content_heading,
course_content.content, courses.course_id
                FROM modules, courses, course_chapters,
course_content
                WHERE modules.module_id=courses.module_id
AND courses.course_id=course_chapters.course_id AND AND
course_chapters.course_id = ".$cos."
course_content.chapter_id=course_chapters.chapter_id AND
course_content.content_id < ".$id."
                ORDER BY course_content.content_id DESC
LIMIT 1;";

        $db = new PDO('mysql:host=localhost;dbname=abkms',
'root', '');
        $stmt = $db->query($sql);
        if($stmt)
            $id = $stmt->fetchColumn(0);
        if ($id !== false)
        {
            $id = $id-1;
        }
    }

```

```

        if($id > 0)
            return $id;
    }
}
?>

```

## Courses model

```

<?php
class Courses_model extends CI_Model {
    function AddCourse() {
        $data = array(
            'course_description'=> $this->input-
>post('course_description'),
            'module_id'=> $this->input->post('module_id')
        );
        $this->db->insert('courses', $data);
    }

    function GetCourse($id)
    {
        $sql = "SELECT courses.course_description,
modules.module_name
                FROM modules, courses
                WHERE modules.module_id=courses.module_id
AND courses.course_id = ".$id."";
        $query = $this->db->query($sql);
        return $query->result();
    }

    function GetCourses()
    {
        $sql = "SELECT courses.course_description,
courses.course_id, modules.module_name
                FROM modules, courses
                WHERE
modules.module_id=courses.module_id";
        $query = $this->db->query($sql);
        return $query->result();
    }

    function UpdateCourse($id)
    {
        $course_name = $this->input->post('module_name');
        $sql = "UPDATE courses
                SET
courses.course_description='".$course_name.'"
                WHERE courses.course_id = ".$id."";
        $query = $this->db->query($sql);
        return $query->result();
    }
}

```



```

function GetModuleCourses($id)
{
    $sql = "SELECT courses.course_id,
courses.course_description, modules.module_name
          FROM modules, courses
          WHERE modules.module_id=courses.module_id
AND courses.module_id = ".$id."";
    $query = $this->db->query($sql);
    return $query->result();
}

function DeleteCourse($id)
{
    $sql = "DELETE FROM courses
          WHERE course.course_id = ".$id."";
    $query = $this->db->query($sql);
    return $query->result();
}

}
?>

```

## Views

### Course template view

```

<!DOCTYPE html>
<html lang="en">
<head>
<?php
//course information
    $course_description;
    foreach($page_elements['course_info'] as $row)
    {
        $course_description = $row->course_description;
    }
?>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0, maximum-scale=1.0, user-scalable=0" />
<!--[if gt IE 8]>
    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
<![endif]-->
<title><?php echo($course_description) ?>~abkms</title>
<link rel="icon" type="image/ico" href="favicon.ico"/>

<link href="<?php echo base_url();?>css/stylesheets.css"
rel="stylesheet" type="text/css" />

<!--[if lte IE 7]>
    <script type='text/javascript' src='js/other/lte-
ie7.js'></script>

```

```

<![endif]-->

<script type='text/javascript' src='<?php echo
base_url();?>js/jquery/jquery-2.0.0.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/jquery/jquery-ui-1.10.3.custom.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/jquery/jquery-migrate-1.1.1.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/jquery/globalize.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/bootstrap/bootstrap.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/cookies/jquery.cookies.2.2.0.min.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/mcustomscrollbar/jquery.mCustomScrollbar.concat.min.
js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/charts/excanvas.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/charts/jquery.flot.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/charts/jquery.flot.stack.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/charts/jquery.flot.pie.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/charts/jquery.flot.resize.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/sparklines/jquery.sparkline.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/validationengine/languages/jquery.validationEngine-
en.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/validationengine/jquery.validationEngine.js'></scrip
t>
<script type='text/javascript' src='<?php echo
base_url();?>js/maskedinput/jquery.maskedinput.min.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/bootstrap/bootstrap.min.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/cookies/jquery.cookies.2.2.0.min.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/nicedit/nicEdit.js'></script>
<script type='text/javascript' src='<?php echo
base_url();?>js/cleditor/jquery.cleditor.min.js'></script>

<script type='text/javascript' src='<?php echo
base_url();?>js/scrollup/jquery.scrollUp.min.js'></script>

```

```

        <script type='text/javascript' src='<?php echo
base_url();?>js/plugins.js'></script>
        <script type='text/javascript' src='<?php echo
base_url();?>js/actions.js'></script>
        <script type='text/javascript' src='<?php echo
base_url();?>js/charts.js'></script>
</head>
<body>
    <?php
        //Body of Page
        $logged = $this->session->userdata('is_logged_admin');

        if(!$page_elements['load_side'])
        {

        }
        else
        {
            echo $this->load-
>view('include/header_course');

        }
        if(isset($page_elements['default_theme']) &&
$page_elements['default_theme']==false)
        {
            echo $this->load-
>view($page_elements['content'].'/'.$page_elements['page_content']);
        }
        elseif(isset($page_elements['default_theme']) &&
$page_elements['default_theme']=='custom')
        {
            echo $this->load->view($page_elements['content'],
$page_elements);
        }
        else
        {
            echo $this->load-
>view('content/'.$page_elements['content'], $page_elements);
        }

        if(!isset($logged)|| $logged!= TRUE)
        {

        }
        else
        {
            echo $this->load->view('include/closing');

        }

    ?>

</body>
</html>

```

## Course view

```
<?php
    //get the messages
    $msg = $this->session->flashdata('message');
    $error= $this->session->flashdata('error');
    if(($error)||$error!="")
    {?>
        <div class="alert alert-error">
            <strong>Oh snap!</strong> <?php echo $error ?>
            <button type="button" class="close" data-
dismiss="alert">&times;</button>
        </div>
    <?php }
    if(($msg)||$msg!="")
    {?>

        <div class="alert alert-success">
            <strong>Well done!</strong> <?php echo $msg ?>
            <button type="button" class="close" data-
dismiss="alert">&times;</button>
        </div>
    <?php
        }
    ?>

<div class="row-fluid">
    <div class="span12">
        <div class="block">
            <div class="head">
                <h2>Content</h2>
            </div>
            <div class="content accordion">
                <?php
                    foreach($page_elements['course_chapters'] as
$row)
                        {?>
                            <h3>CHAPTER <?php echo $row->chapter_number."<
". $row->chapter_description ?> </h3>
                            <div>
                                <div class="block">
                                    <ul class="nav nav-tabs nav-
stacked">
                                        <?php
                                            $ci_obj
= & get_instance();
                                        <?php
                                            $ci_obj-
>load->model('content_model');

                                        $courses_list = $ci_obj->content_model-
>GetChapterContents($row->chapter_id);

                                        foreach($courses_list as $cos)
                                            {?>
```

```

        <li><a href="<?php echo base_url(); ?>courses/topic/<?php echo
$cos->content_id ;?>/<?php echo
$page_elements['course_id'];?>"><?php echo $cos-
>content_heading;?></a></li> <?php
                                                    }
                                                    ?>
</ul>
</div>
</div>
</div>
<?php
}
?>
</div>
</div>
</div>
</div>
</div>

```