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Educational Continual Professional Development Model for Tertiary Education

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A thesis submitted in partial fulfillment of the requirements for the degree of

Masters of Science in Innovative Technologies in Education (MS ITE)

In

School of Electrical Engineering and Computer Science,

National University of Sciences and Technology (NUST),

Islamabad, Pakistan.
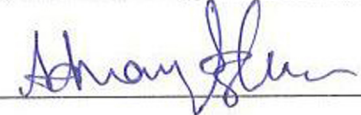
(September 2017)

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It is certified that the contents and form of the thesis entitled Educational Continual Professional Development Model for Tertiary Education submitted by Sikandar Awan (NUST201464627MSEECS61414F) have been found satisfactory for the requirement of the degree.

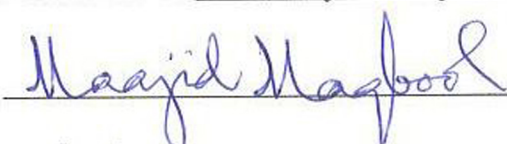Supervisor: __Miss Aleena Hassan Qureshi___

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DEDICATION

Dedicated to my parents for their unconditional love, prayers and support
throughout my life

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ACKNOWLEDGMENT

Contents

LIST OF ABBREVIATION

LMS   Learning Management System

CPD   Continual Professional Development

CMS   Course Management System

PLE   Personal Learning Environment

VLE   Virtual Learning Environment

RQ1   Research Question One

RQ2   Research Question Two

h   hypothesis

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Abstract

Learning Management System or LMS is an advanced e-learning tool which is being used extensively by many universities and educational institutions worldwide. It is an online software program that enables the students to get linked with their courses and its content that the instructors and teachers upload for them. With the advancement in technology e-learning has become highly significant. LMS is getting significant as a learning tool in the education sector. Still there is a way forward, the existing LMS system have their limitations and are not able to work that much efficiently as expected. In this thesis we have conducted a research and tried to evaluate the exact level of penetration and user satisfaction of the existing LMS system. We have also tried to identify the loop holes and short comings of the existing LMS system and tried to devise future framework and a model that will help to over comes these loop holes and increase the effectiveness of the LMS system. No doubt in few coming years we will witness many positive changes and advancement in the LMs systems and it will for sure be able to satisfy us to the greater extent and share of e-learning will increase than other conventional methods of learning in which LMS systems are going to play a significant role.

CHAPTER 1

INTRODUCTION

CONTINUAL PROFESSIONAL DEVELOPMENT (CPD)

Continuing Professional Development also termed as CPD is a process to formulate and document the skills and the learning experiences which one acquires while working on a specific job role. These skills and experiences can be either acquired through a proper channel or formal training or either acquired informally by one's own efforts, observation and learning skills. It can be termed as a datasheet or record of the things what one has learned, experiences and how the individual implements it in daily job role. The term CPD specifically refers to a tangible hard copy documentation or folder record of all the learning experiences. Therefore, Continuing Professional Development (CPD) is used in some organizations for development and training purposes.

DEFINITION

Continuing Professional Development (CPD) can be defined as an exercise to keep record or document the learning experiences and the development of skills which they acquire in their professional career. This exercise is to keep them up to date and keep on developing their professional skills.(1, 2017)

IMPORTANCE

CPD is important because it is the record of one's own learning skill sets, development methods it helps and individual in his professional development learning and growth. CPD is result oriented and its one personal record book. It is not generalized and can be implemented on groups. It's a kind of personal self-dairy and record which is applicable to that specific individual for better understanding and professional development. Therefore, it is completely personal.(2, 2016)

The scope of Continuing Professional Development (CPD) is one own personal record or file it's not a certificate or a diploma that one attains from a learning intuition or course it is a self-documented and regulated learning experiences that helps and individual to keep record of his skills and knowledge what he/ she has acquired. This record is really helpful for an

individual for self-assessment, self-development and developing ones professional working techniques. (3, 2014)

TRAINING & DEVELOPMENT COMPARISON

Training and Development are important terms regarding the process of CPD but these terms are sometimes confused when it comes to the meaning. Regarding CPD both these terms has to be clearly defined. Training means process that is formal and carried out through a proper course which involve learning of specific techniques, methods and set of knowledge. Training can be simple and a hard one for instance operating a computer or manufacturing process of an automobile. It is a sequenced process.

Whereas, the term development is mostly used in a wider sense as an informal mean or way to gain or attain any skill or knowledge. It does not involve a sequenced process or course. It comprises of basic know how of a particular filed to the complex knowledge and techniques one develop on one's own. It is multi-dimensional and can be widely used and applicable for an individual without any proper sequence. The development phase can be used implemented and changed according to the need and capacity of an individual.

CHAPTER 2

LITERATURE REVIEW

KEY FEATURES OF CONTINUAL PROFESSIONAL DEVELOPMENT (CPD)

Now let us analyses the key features of CPD which will help us in better understanding of the term and the process involved.

The following are the important key features involved in CPD

1. A CPD should be a documented process. It should involve a file or a folder and the experiences and development process and skills are noted down in a hard copy format.

2. This process or record is not related to the employers tasks or part of his record or assessment it is completely self-directed by the individual and is one's personal record.

3. The CPD or the maintained record will direct the learning process from the experience obtained as drafted in the documentation and will enable the reflective learning process and review for the individual.

4. The CPD documentation record will help an individual to set targets, goals and individual defined objectives and will help in the development process.

5. The CPD documentation will include both forms of learning formal and informal an individual had acquired in the professional career.

OBJECTIVE OF CPD

There can be various important objectives of a CPD. One of them can be certain professional bodies or organizations require CPD as a condition for their membership so it is important for a working professional to acquire a CPD. A CPD will help in a detailed documentation of an

individual's learning, experiences and skills and will help him in developing and reviewing his personal professional skills.

We will look at some main objectives of CPD which are as follows.

1. A frame and up-to-date documented professional development of an individual's career which provides an overview of that individual professional life experiences.

2. Provides a progress root map of an individual's professional achievements and learning skills.

3. Set targets and define career goals and provide a composed direction for the individual to follow to excel in the professional career.

4. Highlights the weakness and short comings in the professional career as well as learning skills and experiences of an individual. So that he can try to cover up the weaknesses.

5. Set the standards and direction for development phase for the individual professional career.

6. Helps in providing material and case studies to be included in CV or resume of an individual and also answering the questions in a professional interview.

7. It can be also helpful in providing an individual's standing and overview to his clients and the employers he is working or willing to work with.

8. It pushes you to the career development or sometimes changes in career for individual for seeking better professional position.

PROCESS AND TECHNIQUES INVOLVED IN CPD

In framing a CPD there are certain ways to being and process to be followed that can help in drafting a CPD in a professional way. As the CPD is a personal record there is no certain formula or mathematical technique to it as this process is informal. But still, there are certain

methods that can be taken up whiles formulating a CPD. We will look into the process in detail.

As DCP is documented, so an individual should draft a learning log and note down the thoughts and the ways suitable for him. In this regard one can write down the experiences in detail can mention examples write down views and observations about certain situation and make some learning points out of a particular situation. Due to this process of drafting and writing down the individual tries to think in detail about the particular experience he had it helps him in planning and handling for future of a same or similar circumstance in a better and improved way. It also help you in reviewing your judgments made on a particular situation when the experiences are recorded it is really easy to analyses and review them as compared to unrecorded events and experiences which is almost impossible to analyze and review. Following is the process model of CPD which shows its key features.

Reflection	Planning	Actions	Outcomes	Evaluation
What do I need to know/be able to do?	*How can i learn?*	*What learning am I undertaking?*	*What did I achieve?*	*How has my learning benefitted myself, others and my organisation?*
User reflects on previous year and identifies learning needs	User creates a Personal Development Plan (PDP) and assigns objectives to the year ahead	User undertakes and records activities in support of objectives and plans	User reflects on activities carried out and assigns completed activities to plans, objectives and learning outcomes/frameworks/ curriculum	User or others undertake evaluation of performance related to activities, objectives

Figure 1: CPD Key Features (premierit, 2016)

To get started in the CPD process one can formulate certain questions to be answered by one own self as a part of documentation. A questionnaire is made and documented then the answers are written accordingly. For instance a simple CPD model can be as follows.

- *Where am I standing now?*

Answering this simple question can provide us the start from framing a CPD. An individual can recall the previous experiences of the previous year of or a half year or a quarter can analyze them and start noting it down on a paper. One can openly write what experience one got in that specific period of time, what did he learned, what observations did he made, what

options he took and act upon, whether the results and outcomes were expected or unexpected, what insight it gave to him, what other options he had how he could have done a better job, what different approach he might have adopted to achieve better results. All these details can be noted down as the answer of these questions with minute details. It can also include the formal trainings and the informal learning experiences he has acquired in the specific period of time. He can mention and note down his self-evaluation after answering all these questions.

INFORMAL LEARNING

Informal learning includes all the learning a person acquires without enrolling to a particular course or class room. It may include (3, 2014)

- Learning form surroundings, working environment, colleagues, tips and personal observations.
- Self-Reading about new technologies, methods and techniques through internet, books or through other print and electronic media.
- Helping or observing the team members, seniors or colleagues and acquiring new knowledge or skills.
- Insights, observational learning, self-coaching and monitoring.
- Learning and experiences obtained from taking on a new responsibility.
- Learning and experience obtained when changing a working organization or a job role.
- Learning and experience obtained from temporary job role change with a department or organization.
- Substituting or representing your colleges in case of emergency of their absence.
- Lessons learned from the mistakes and insight about them.
- Lessons learned in a critical or panic situation or accident or event.

One can draft a note for the possible options that are available in a certain critical situation how much the selected option affected the outcome, how much it affected one own self and also the other colleagues. What was the best possible outcome for the same situation that could have been adopted and how it may have affected the individual himself and his fellow members?(3, 2014).

- ***What is my goal or targeted position or standing?***

The answer to this question will set up short terms and long terms goals for your professional career. One can note down important goals an individual wants to achieve in next coming 5 years and 10 years. What skills set he wants to acquire in these time periods. One has to write down all the goals. One can write generally three short term goals for next few coming months with dates and time limits and can also write long terms goals in the same manner.

- ***How can I achieve my defined goals? / What I have to do?***

After review and careful analysis of one's goals one can note down and frame the resources and road map to achieve those goals. For instances what trainings are needed to achieve these goals, what particular skill set and trainings are required or a different job role or position. This will help in defining the direction of the career to achieve that particular goal. For a short term goal on can start from today or tomorrow that I have to have a talk with my manager about a particular job role or position or a person who has experience of that thing, or surf the internet to get the road mad or register myself in a training program or note down the prerequisites required for enrolment in a course or training.

- ***How and when to review the progress?***

This step is really important in the CPD process because you have to get the feedback and track record of your performance and evaluate yourself that if you are lagging are on proper time course. For this purpose one can set a date that on this particular date I will review my performance and evaluate my speed towards my goals or one can set a periodic review time that after every two months I will review my record. Note this evaluation on a paper and keep it as a part of your record. In this way the process of developing CPD is started.

CHAPTER 3

THE CPD CYCLE

The CPD cycle is the way that is followed how one can structure ones CPD. This is a process which involves different stages we will look into the stages in detail. The CPD cycle is as below.

Figure 2: The CPD Cycle (4, 2016)

STAGES OF CPD
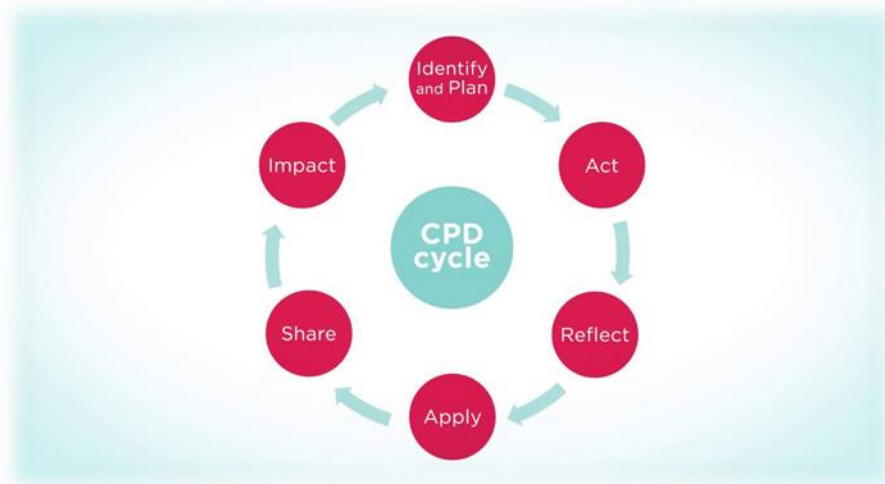
The following are the main stages involved in CPD

Figure 3: Stages of the CPD Cycle (2, 2016)

IDENTIFY AND PLAN

The first stage of the CPD development is the identify stage which sets the platform to plan the journey in this regard. The first and most important point of consideration is to analyze and identify the current standing position of an individual and think or set a target where he wants to go or seem himself or what position he wants to attain. This is going to set the road map for future course of action and planning phase for it.

In this phase one needs to analyze one's current position, his past and what position or mile stone one wants to achieve in the future. The CPD is a cyclic process in this process there is a point of continuous learning process. This process is evolving with each and every passing moment for an individual. Therefore, it is important for an individual to identify first that what learning skill he needs to get to the position he is aiming for in order to achieve this goal and how would be he able to do so. A through self-assessment is needed to identify the individual's current position against certain professional standards.

After identifying, immediately comes planning. When the current and the desired positions are clear or we can say the current position and the destination is set the phase of planning starts that how to achieve one's desired destination. An individual has to identify the check points of his destination to keep a record of the progress and resources needed to reach that particular mile stone. There isn't any specific time for starting the planning process but it can be aligned with the annual development of an individual to maintain a smooth record and performance review.

This process can be termed as a sketch of your road map it might be regarded as agenda. It will be brief and generally not involved extensive learning processes. It is a guide line that one has to follow the other detailed stages and their analysis and recourses can be analyzed on the later stage in detail. A development plan is needed at this stage it has to be formulated on a hard copy. The example or template of a development plan is as follows

Development Plan

NAME:		MEMBERSHIP NUMBER:	
COVERING THE PERIOD FROM:		TO:	

Planned outcome

Where do I want to be by the end of this period? What do I want to be doing? (This may be evolutionary or "more of the same".)

What do I want/need to learn?	What will I do to achieve this?	What resources or support will I need?	What will my success criteria be?	Target dates for review and completion

ACT

After the identification and planning stage comes the stage of Act or Action. The plan that one has formulated might contain many areas and fields of application like extensive learning, changing a job role in an organization or keeping up to date with certain areas of knowledge and fields. All these are form or resources some that are available and someone has to acquire. These recourses will help to move forward to the set goal.

Some of these resources are as follows:

Practical Resources:

It can in include books, magazines, journals, reports and research papers related to the area of the field you want to acquire or build knowledge about. All these media will help in learning new knowledge.

Learning New Skills:

The next most important recourse is to learn or develop new skills. With leaning or getting a professional training you have focus on obtaining new skills like time management, leadership skills, team work and dealing stress whiles working. All these skills will be building up simultaneously and will act as a resource whiles moving towards the goal. These would be helpful in every step of your journey.

Career Advancement:

CPD should also contain ways and plans for advancement in career that might be a check point or a sub stage in achieving the main goal or target. In this regard one can focus on preparing for interviews and making resume more attractive so that the chance for career advancement may increase. In this regard one can attend trainings and workshops to acquire the desired skill set.

Daily Learning:

Every day learning is very important and keen observation is the key to it. When one is working on regular basis one can focus more on day to day learning what he has learned new today and keep the record of it. It will enhance the learning of the individual in many directions which he might not be able to get from a practical resource do to any reason of time management or lack of recourse availability.

REFLECT

In professional development reflect stage is known as reflective practice. This is an important method for professional development. It helps in improvement of communication skills, self-awareness and critical thinking.

REFLECTIVE PRACTICE

In the 21st century working environment has been really fast and busy by the advancement of technology. In this fast working lifestyle it gives us the opportunity to learn and develop knowledge on day to day basis learning from our work and environment. Through Reflective Practice we can develop and transform our day to day learning into practical strategies and insight learning. This can help in personal growth of an individual. That's why the impact of reflective practice is significant in today's working environment.

The reflective practice can be carried out through daily conversation or day to day writing we carry out in our working as well as use of phrases and metaphors. This process can involve individuals as well as groups. In this process we will analyze our thinking critically, check our decisions and judgments, re think about our values, behaviors perceptions, assumptions, and questioning each and every think on a positive ground in order to get improvement.

As a particular individual can do a better self-assessment and have a better insight of one's own mind and personality so they can formulate their own reflective practice well. Through

this self-assessment and there are high chances of improvement in reflective practice abilities. Therefore this practice is highly encouraged. Through this process we can actually analyze about ourselves how we interact with the world and what are the dimensions of our thinking and personality.

Now there comes the question of what is the need for the person to reflect. Why it is important? This is important because this process can help you to develop many day to day skills for instance improvement in critical thinking, self-awareness and communication skills. These skills are really important for a working individual. One can also develop creativity and improve problem solving techniques with resilience and time efficiency.

How to develop and practice the reflect skill is an important question at this stage. As mentioned below the pace of working and work life style is so fast that it is hard to take time out and reflect on our daily routine because we are programmed to move fast with the flow. But for adopting this practice you have to make it a habit as it requires physical and mental effort. It can be regarded as a daily exercise until your mind gets used to it and you don't find it an extra work. For this one has to be persistent and be focused.

With the development of this habit of reflective practice the individual will be able to channel your learning and apply it to your daily work unconsciously. It won't be an extra activity for you anymore.

Reflective practice can involve the following steps

- Improvement in paying attention.
- Listening to ourselves.
- Critically analyzing our assumptions.
- Noticing patterns.
- Changing what we see.
- Changing the way we see.

APPLY

After covering the first three stages comes the stage of applying. At this point of cycle an individual has come up to the stage where he has acquired extensive knowledge through reflective practice now a game plan has to be developed to apply what he has learned. The amount of learning depends on the individual's capacity and skill and it does affect when you

apply the learned knowledge in your work. To learn something requires repetition and practice so for an individual to learn a particular thing better is important to look for opportunities that will help him to learn and apply the same thing over and over again it will help him to absorb and retain the learning for a longer period of time. This can be achieved by taking up new job role or starting a new projects taking part as a volunteer in projects even if you have to go out of your way and keep taking feedback from your colleagues and co-workers.

In this process one will notice that there are certain things that one needs to revisit or revise to put them to action or apply them in ones work because they have not been learned strongly. For this purpose that thing has to be repeated and it might take two or three times to go through the same process of learning to master it and to be capable enough to apply that learned knowledge in particle. When you keep on applying the learned skill in your work it will make you enter the group of people having same experience of the skill and you will be sharing the same experience with them this will lead to the next stage of sharing. As **Stephen R. Covey** said,

'To learn and not to do is really not to learn. To know and not to do is really not to know."

SHARE

At this stage an individual is already sharing certain skill sets and practical knowledge which a certain group of people have experienced. In this stage an individual will share one's own learning experience with the other individuals of the same group and will try to take benefit from their experiences or add to their experiences.

This stage might not involve much effort because you might be sharing your experience with an individual because he needs your help or point of view or you might be sharing with him because you learned something new. It is rather a comparatively easy process and focuses on either giving or receiving benefit from other individuals.

Learning is a continuous process it does not halt it keeps on going and there is always something new to learn and practice. With sharing one can benefit from other experiences get feedback about their work can polish their skills. This is a great way to collaborate with the other individuals and help in building social networks and exchanging ideas among the group.

There are many platforms available for sharing. Some of the noted ones are LinkedIn twitter etc. Hence social media internet blogging can be used as tool and a platform for sharing your learned experiences. In this way one can portray one's identity on a larger scale. One can also do so in conferences seminars and exhibitions there are lots of opportunities once it comes to sharing with the world.

IMPACT

The final stage is of impact. Once you go through all the stages of CPD for sure you have undergone development in your skills and learning abilities as well as knowledge which will for sure create an impact of your personality and on your professional work. One can feel the sense of accomplishment at this stage and can celebrate ones success and aim for new goals and think of new possibilities. This stage you can analyze what output you are getting and what impact you had made on yourself as well as your working organization. Mostly the impact would be in measureable terms like what have you achieved like improving the time efficiency of the work, minimizing the production cost and increased productivity and revenue. At this stage you can look back at the goals you had set in the start compare and analyze what have you achieved and how much successful you have been. At this stage there are some common questions that one can ask one own self.

- What new knowledge and things I have learnt and acquired?
- Was I able to achieve my set goals?
- What were the barriers and outcomes that I faced in this journey that was unplanned?
- What were my barriers in the whole process?
- How did I carry out my learning in application of my work?
- What was the impact of my learning and application?
- What lessons can I derive from my experience?

Even at this stage not all the things that you have learned had come under application and practice. There is always a room for new opportunity but still at this stage you will be able to measure the impact of your journey and you would be able to know the factors what would help to improve the impact.

CHAPTER 4

CPD IN EDUCATION

The idea of knowledge and learning as embedded in social contexts and experiences, and promoted through interactive, reflective exchanges. The assumption that participation in CPD leads to changes in teaching practices and enhancement of student learning

KOLB'S LEARNING CYCLE

In 1984 David Kolb presented his learning cycle. He developed his learning styles from this cycle. It consists of a four stage cycle and four different learning styles. Kolb's theory mainly focuses on learner's internal cognitive processes.(Mcleod, 2010). According to Kolb learning is a process that is an abstract skill an individual acquires and it is applicable to wide range of situations. He further states that new experiences trigger new modes and ways to learning. "Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984)
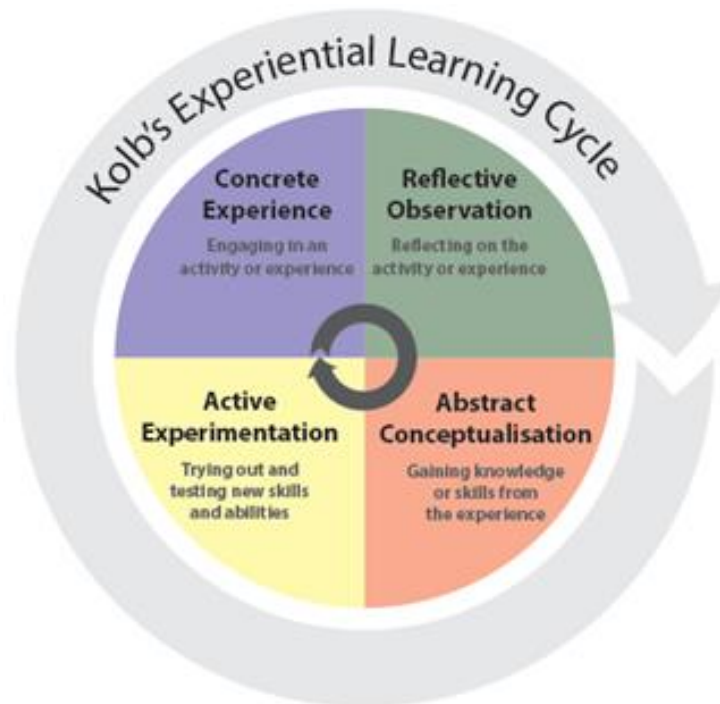

Figure 4: Kolb's Learning Cycle (Skills you need, 2016)

THE EXPERIMENT LEARNING CYCLE

1. **Concrete Experience**

   It can involve a situation where an individual encounters a new experience or interpret the existing experience differently.

2. **Reflective Observation**

   It can be applied to a new experience. Experience and understanding are analyzed and matched accordingly to find out any inconsistencies.

3. **Abstract Conceptualization**

   After reflection one might be able to generate a new idea or modify an existing concept or an idea related to the experience.

4. **Active Experimentation**

   In this process the individual who acquired the set of knowledge applies it to the surrounding and his work to see the results and draw conclusions.

LEARNING STYLES

According to Kolb learning theory, learning has four different styles that are mentioned in the Kolb cycle. Kolb in his theory says that different people adopt different style of learning it varies from person to person and the level of complexity of learning style is different for different individuals. The learning style of a person is affected by various factors. It can be influenced by his educational experiences, social life or basic cognitive structure. Regardless of what affects our learning style according to Kolb the learning style is product of two variables. The first is called Processing Continuum which means how we approach a particular task. The second variable is known as the Perception Continuum which means what we think or feel about a certain thing or what is our emotional response towards it. These two variables are presented in two continuums at east-west is the Processing Continuum and at north-south is Perception Continuum. According to Kolb these two variables can on exist on a single axis or we can say that these two ways cannot be performed at the same time. He also said that our learning style is the product of the two above mentioned variables. Kolb's learning styles are often represented in a matrix of two by two which gives a better understanding of the concept. By the combination of two preferred styles every learning style is represented in this table. The matrix shows the name of the four learning styles proposed by Kolb that are Accommodating, Converging, Diverging and Assimilating. The Kolb's learning style matrix is given below:

	Doing (Active Experimentation - AE)	Watching (Reflective Observation - RO)
Feeling (Concrete Experience - CE)	**Accommodating (CE/AE)**	**Diverging (CE/RO)**
Thinking (Abstract Conceptualization - AC)	**Converging (AC/AE)**	**Assimilating (AC/RO)**

DISCRIPTION

If a person or an individual is aware of his learning styles than it is easier for him to carry out the learning process more effectively using his/her preferred learning style. In this way learning process can be more effective and level of understanding can be increased. But still a person cannot rely on one style of learning, it might be a preferred way for learning but he/she still needs all four styles. But under specific circumstances one can use the preferred learning style more than the other styles. We will look Kolb's Learning Style in detail.
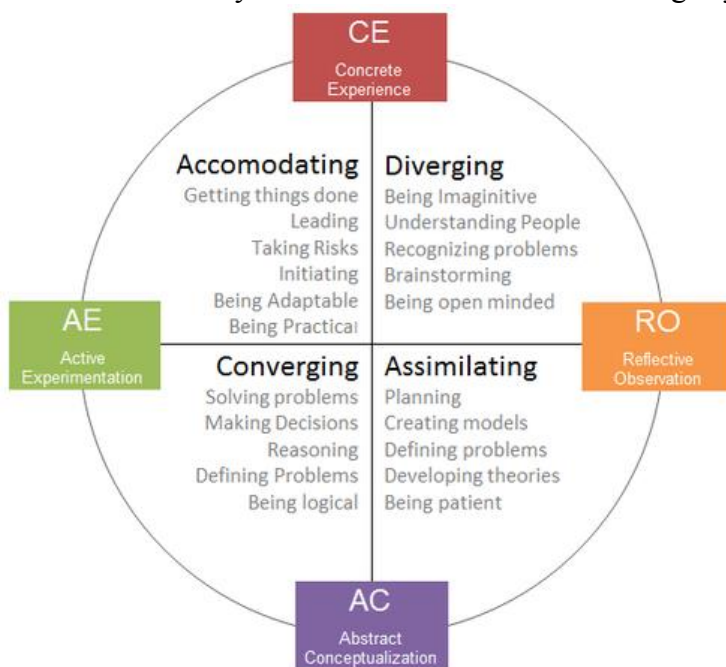

Figure 5: Kolb's Learning Styles (2017)

DIVERGING (FEELING AND WATCHING -CE/RO)

People who have a diverging learning style are generally more sensitive. They have a unique way of looking things from different angles and perspective. They are good and keen observers, observation is their strength. They like to watch things closely rather than taking

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action and try to solve a problem or a situation in the mind by watching it. Their strength is the ability to watch, observe and analyze different situations and their main points. People that prefer this type of learning style perform really well under situations that require problem solving through idea generation and visualization. This action an idea generation can be called as brainstorming. Therefore Kolb named this learning style as diverging. The people which are more inclined to the diverging learning style like to gather information using their observational skills and have broad cultural interests. These types of people have liking of art subjects like painting, music calligraphy or photography this is because they are highly imaginative and have interests of people and nature. They are emotional and sensitive kind of people generally soft and kind hearted. The people having a diverging learning style feel good working in a group are social and want to know about themselves by the feedback of their friends and circles and accept the feedback with an open mind and positivity.

ASSIMILATING (WATCHING AND THINKING- AC/RO)

This learning style is a bit concise and more logical in approach. The person having this learning style focuses more on ideas and concepts rather than people. The people following this style prefer clear good explanation over practice opportunity. These people are really strong at gathering information and converting that information into logical results. For such people ideas and abstract thinking is more important than people they are more focused in result oriented thinking. These people are more focused on theories that are logical and are attracted to such concepts. They might not feel so attracted to practical values or approaches that do not feel much logical. Such people often take up science as their field on interest and study. They also pursue their careers in field of science because they like learning, exploring, analytical reasoning and critical analysis.

CONVERGING (DOING AND THINKING-AC/AE)

People having converging learning style will like to problem solving and find solutions to the practical problems using their skills. These people are technical in nature and try to find technical solutions of the problem. They are less interested in people and interpersonal aspects. They are problem solvers and through their learning they can find answer to unanswered questions and find ways and solutions to different and difficult situations. They are not much focused and attracted to social interpersonal issues rather they focus on technical work and challenges and try to invest their time and effort in that area. People having a converging learning style will give technical framework for different problems.

They love to use technology and like to experiment create new practical ideas for implementation.

ACCOMMODATING (DOING AND FEELING CE/AE)

This style of learning focuses more on hands on work and practical using intuition as an approach rather than a logical approach. The people using this style of learning; like to experiment using the researches and approaches of other people. They like to face challenges and are attracted to new experiences and implement their plans. They do what their heart tells them to do mostly work on the gut feeling rather than using logical reasoning and calculated approaches. The people having accommodating learning style will improvise and use the information provided by other individuals. They don't go for much logical analysis. This learning style is a common man learning style.

CHAPTER 5

LERANING MANAGEMENT SYSTEM (LMS)

The LMS is used to facilitate the students with trainings and courses using a computer program mostly through online resources or internet. It helps one to maintain courses edit them get feedback and coordination with the students and can be used for assigning assignments, grading and marking attendance. For instance Gmail is used to manage one's email same as a LMS is used to manage online courses and trainings through computer software. LMS is a tool to provide e learning. An LMS mainly consist of two major parts.

The first one consists of a core server system on which the data base is developed and the lectures/assignments are created, uploaded, saved or edited. The second one is the user interface that runs on the web browser of the machine of the users who have access to the LMs programs i.e. teachers and the students.

Figure 6: Learning Management System LMS (researchgate, 2010)

CONCEPTUAL DIAGRAM OF LMS

The conceptual diagram of LMS shows the major requirements or needs of the users of the system. How these needs can be fulfilled by the software system. How they can integrate in a way that it could facilitate the users of the system. Below is the conceptual diagram of the Learning Management System LMS which will enable us to understand the concept of LMS better. It shows what standards and curriculum should be followed, how to analyze the assessment and growth of a student, what will be the learner portfolio, what will be the instructional practices and details of the facilitators profiles.
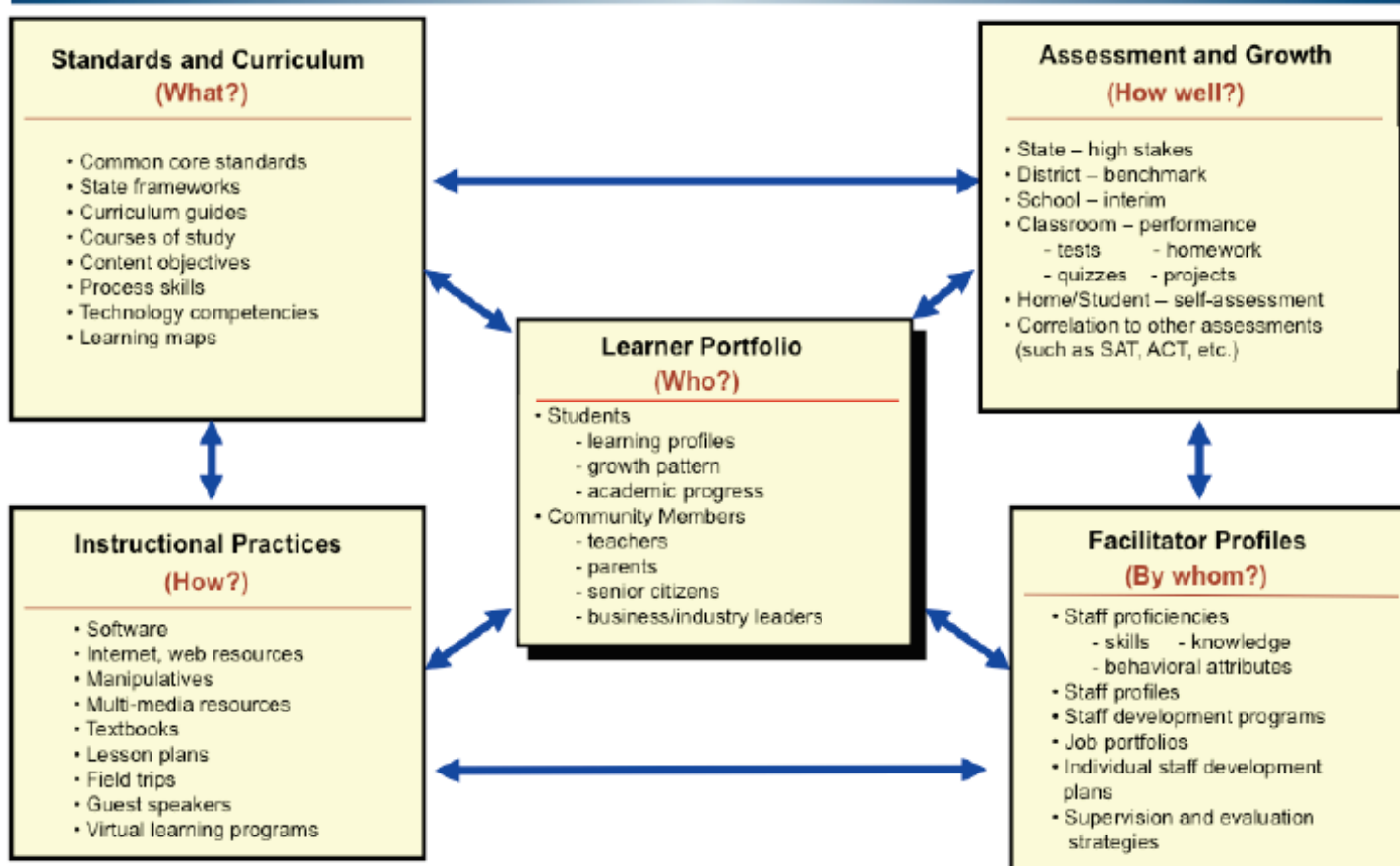
Figure 7: Conceptual Diagram LMS (Jhon Phillipo, 2012)

Users of LMS systems are mostly universities because where ever there is need of e learning LMS comes to play a significant role. Other than universities multinational business organizations like IBM, DELL, HP have also use LMS systems to train their professionals and their business partners. Some schools and virtual universities only focus on e learning in such intuitions LMS is the backbone. Some of the Major applications of LMS are as follows (What LMS)

- **Employee Training**:

  Multinational organizations used the system of LMS for the training of their employees as well as business partners. Companies like IBM DELL and HP have their own LMS systems where they provide online training to the employees. Courses are available online one can register in the portal and take up the course. At the end of a course is an online test which the learner has to take. After getting the passing criteria a certificate of course completion is given online at the name of that person.

- **Employee Orientation**:

  LMS can be used for the purpose of employee orientation within a business organization. The CEO sitting in the head office can connect to the branch offices in remote areas and can take the orientation of the new recruits. He can also guide them with their job roles, assigned tasks, daily or weekly activity reports and targets achieved. It can also be used to provide adequate information or data required for the employee to work on a certain project or to present a presentation. It can be used to educate the new employees to the company's rules, regulations and policies.

- **Knowledge Retention** :

  When an employee works in an organization all the work he contributes his experiences or reports he generated or the clients he worked on and his contribution to the company is an important record. In case if the employee leaves the organization it is important for the company to retain his work data that would be useful for the organization. Through LMS the organization can easily retain the working data of the employee who quits the job. It can also help to train the new employee who takes the seat of the ex-employee.

- **Education**:

    In education sector LMS presence is immense. From universities to online institutes all trust on the system of LMS and use it for teachers and students coordination. Providing e- learning courses, taking attendance, uploading grades and results, taking tests, workshop and training hence all are the features of LMS. Even now some government and NGOs are using LMS to educate their audience by providing courses and instructions to them.

LMS SOFTWARE IN THE MARKET

There are many LMS software available in the world some of them are as follows (LMS, 2011)

1. Moodle
2. Canvas
3. Edmodo
4. Oracle Taleo Cloud Service
5. BirdDogHR
6. EduBrite
7. LearningStone
8. Path LMS
9. Totara LMS
10. Qintil
11. Capabiliti LMS
12. ProProfs LMS
13. Biz Library
14. Schoox
15. Learning Cart

DESIGN OF LMS SYSTEM

LMS system program is usually a server or cloud based program so that it can be easily accessible from different areas and networks. LMS in general has all the information about the courses and its content and about the users operating it. The concept of LMS system is to minimize the boundaries of time and space in the field of learning and make it more efficient

and effective for the users. It is a concept of e-learning. LMS or Learning Management Systems are also known as Course Management System (CMS) because they mostly handle different courses. They are other names of LMS too depending upon its functionally sometimes it is referred as Personal Learning Environment (PLE) because it provides a personal account for learning purpose, it is also referred as Virtual Learning Environment (VLE) as it is operated virtually and is the purpose is e-learning. Because of e-learning it is also known as e-learning courseware.

LMS DEFINITION

An LMS system is software based program which enables us the administration of learning courses, documentation, reporting/tracking and provides e-learning facilities to students using online system. (Ellis, 2009)

The scope of LMS is not just limited to universities or educational institutions but it is also used in industries for employee training and other purposes. In case of Educational Learning Management SystemLMS it is a two way interaction between the students and the teachers/instructors which results in e-learning of different courses. It also support student to student communication based on the courses and its content. The features of industrial LMS are different from the educational LMS. The main features of an educational LMS program are listed below.

EDUCATIONAL LMS FEATURES

Here are some important features of educational LMS.

- ✓ An LMS system is a centralized system with automated administration.
- ✓ It uses services that are self-service and self-guided.
- ✓ It delivers learning content frequently and periodically.
- ✓ It runs on a web based platform, and provides training facilities.
- ✓ It supports the features of portability and remote access.
- ✓ It supports personalization, user security and facility to reuse the knowledge again.

All these features help the teachers/instructors to interact with the students about the courses and its contents which results in e-learning.

PARTICIPANTS OF LMS PROGRAM

In current scenario almost all educational institutions like universities are using LMS programs for e-learning. The participants of users of LMS program are as follows

1. **The Learner**

   Learners are the students and are the main and most important users of a LMS system. They carry out learning thought the LMS system.

2. **The Instructors**

   The instructors are also called teachers. They can also be teacher assistants. Their role is to manage the course and its content on LMS, upload necessary course files and information for the students and evaluate the learners accordingly.

3. **The Administrators**

   The administrators are responsible for smooth running and operation of the system and to resolve any issue or provide any necessary support, security or access to the other users of the LMS system.

LMS PROS & CONS

The existing LMS systems being used in universities and other educational organizations have some advantages and disadvantages at the same time. We will look into both in order to analyze the pros and cons of the system so that we can make it better and effective.

ADVANTAGES

By using the LMS system efficiently and effectively, it can help to promote learning and learning process. It can help to increase the motivation level of the learners. It will also be helpful in improving the communication between students and the instructors and the feedback process related to the courses resulting in enhancement of the learning process. Today LMS system supports different from of multimedia content like images, videos and audio files which are very helpful in the learning process. One of the major advantages of LMS system is that the access of information is available any time of the day. There is no restriction of time students can access the course material anytime and teachers can also upload the content to their ease. They can change, modify or update the content of the course at any time and send the update to the students who can know easily about the changes made. This definitely improves the conventional methods of teaching. Various other features of LMS can be used for students like class attendance or results or submission of assignments.

All the uploaded content can be re-used which saves time and effort of both the students and the teachers.

DISADVANTAGES

Here are some disadvantages of the existing LMS System which can be improved with time and advancement. Existing LMS system lag in teaching styles they do not have much teaching styles and are majorly course centered rather than student centered. Some instructors or teachers are weak in use of computer of software skills they find it hard to use LMS and interact with students they try to use conventional teaching methods. If they have to use the LMS they won't use most of its features which decreases the scope of LMS. Some teacher use LMS same as their conventional teaching methods by doing so the importance of using LMS is decreased. According to some researches use of LMS increases teacher's workload.

COMMON FUNCTIONS OF LMS

An existing LMS system can have following common functions.

- Registration of students and teachers.
- Enrolment of courses.
- Adding, modifying or deleting a course or content by teacher of by university board of department.
- Management of user accounts and assigning different roles/authority to them.
- Giving the course Calendar.
- Send and receive assignments and tasks
- Evaluate and post results
- Mark attendance
- Discussion Forum and feedback options.

CHAPTER 6

LMS SYSTEM MODEL

A simple model of a LMS program is shown below. This model shows the different job roles of the users of LMS and how they interact with the system and with each other. It also shows the functionality of the system and facilities it provides to its users. The diagram shows in detail concept of an LMS system.
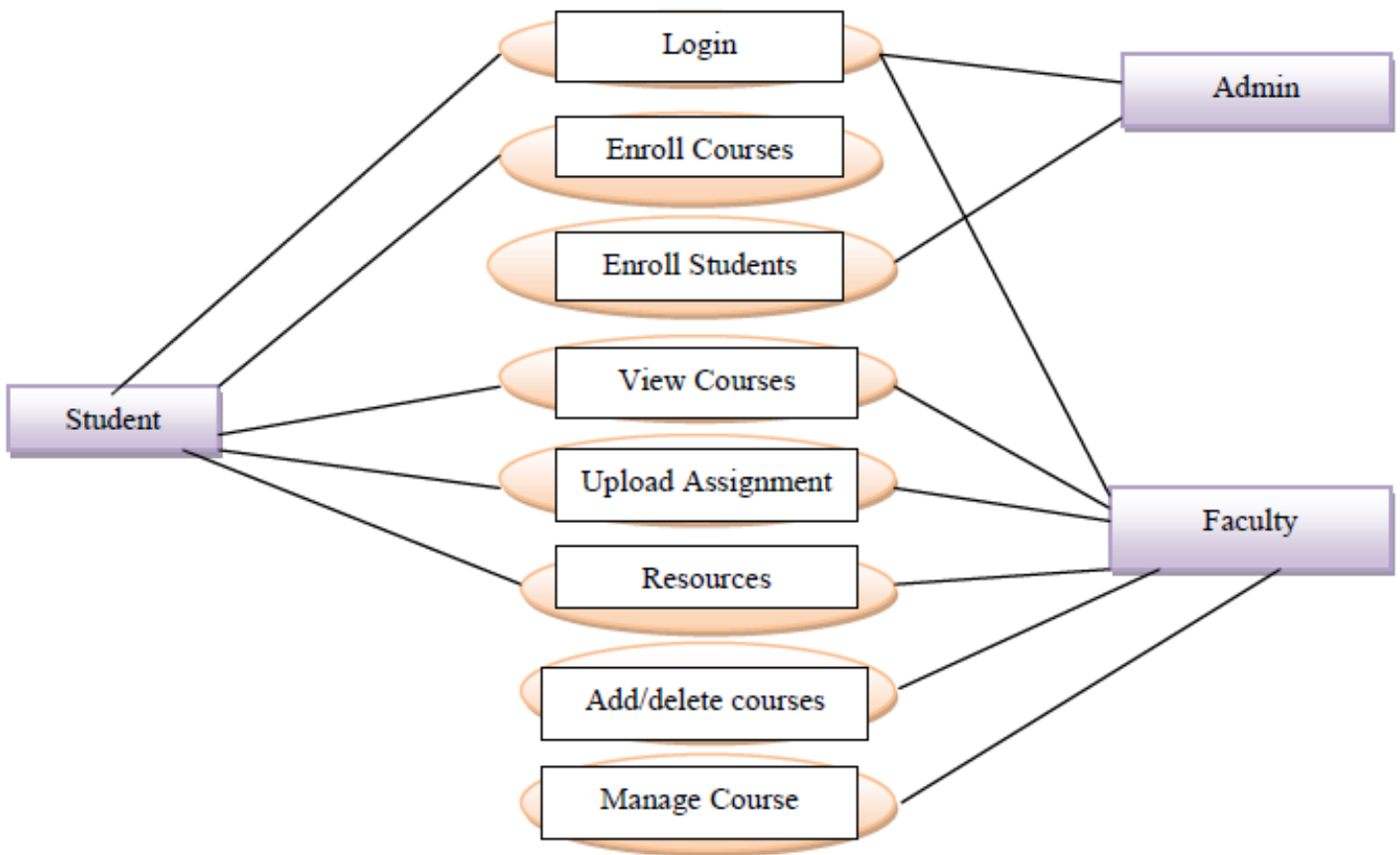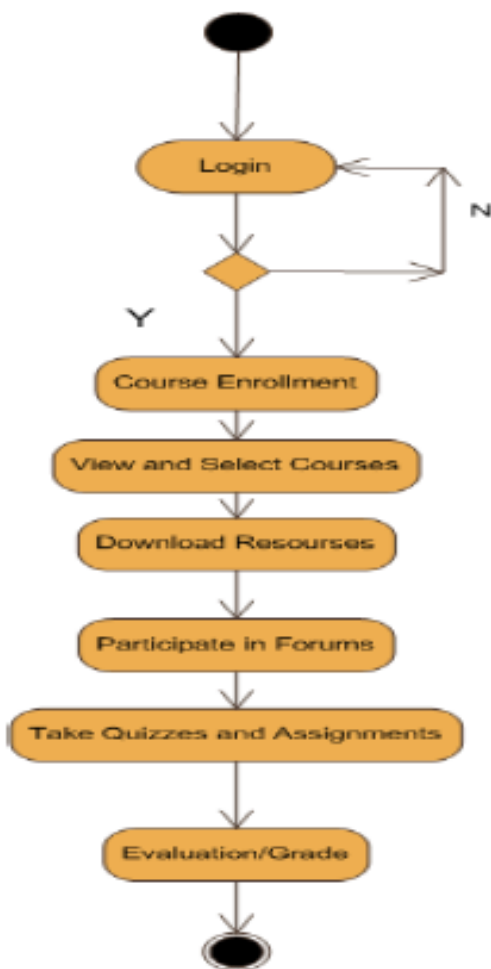

Figure 8: LMS Model (Ankita Sharma, june 2013)

ACTIVITY DIAGRAM

The activity of users i.e. students and the teachers will be described through an activity diagram. The students and the teacher activity diagram differ as their role and interaction with LMS system is different. Below is the activity diagram of the student and teacher interaction with LMS.

RESEARCHES ABOUT LMS

From past few years the databases software are combined and integrated with training programs workshops and digital frameworks to produce different sorts of LMS programs. It helps the used to create, manage and carryout the learning process online and on the go. No doubt it has become a significant tool in educational organizations all over the world. It has changed the traditional ways or learning or class rooms into e learning and a digitized environment. An estimate of over 600 LMS softwares is available in the market today having different features according to the user and the business requirement.

Some of the main features of these LMS softwares are (Ankita Sharma, june 2013)

- Rosters

- Registration

- Document Management

- Multiple and mobile device access

- Distributed instructor and student base

- Calendars

- Student Engagement

- Testing and Assessment

- Grading

- Multi Lingual Support

- Marketing and Advertising services

With the advancement in the technology LMS has to be improved in this regard different researches has been carried out. Researches are being carried out in this regard. Researches shows that most of the instructors use LMS just for the purpose of uploading materials not for the interaction with the students for instance using chat features, email and discussion forums. There is a need to focus on these areas and make this features more user friendly and accessible to the users. Some of the instructors do use LMS as a discussion forum but the slow or lack of feedback mars this process so there is a need of mobile access for LMS can

develop android applications which can show notifications accordingly. There is also a gap between students and teachers to implement and used of the LMS technology frequently so there is a need to make the LMS system more adaptable and customizable. Researches also show that the use of LMS also depends of the time commitment of teachers and the students. (Ling, June 2013)

Some important areas of research in LMS are (Nair., March 2012)

- Learning Content Manager
- Content Assembly Tools
- Catalog Manager
- Learning Planner

MODERNIZED FRAMEWORK

Below is the modernized frame work of LMS based on the latest requirements and ongoing researches. The framework shows different components of LMS system and how they are integrated and interacting with each other facilitating the needs and requirements of the users.
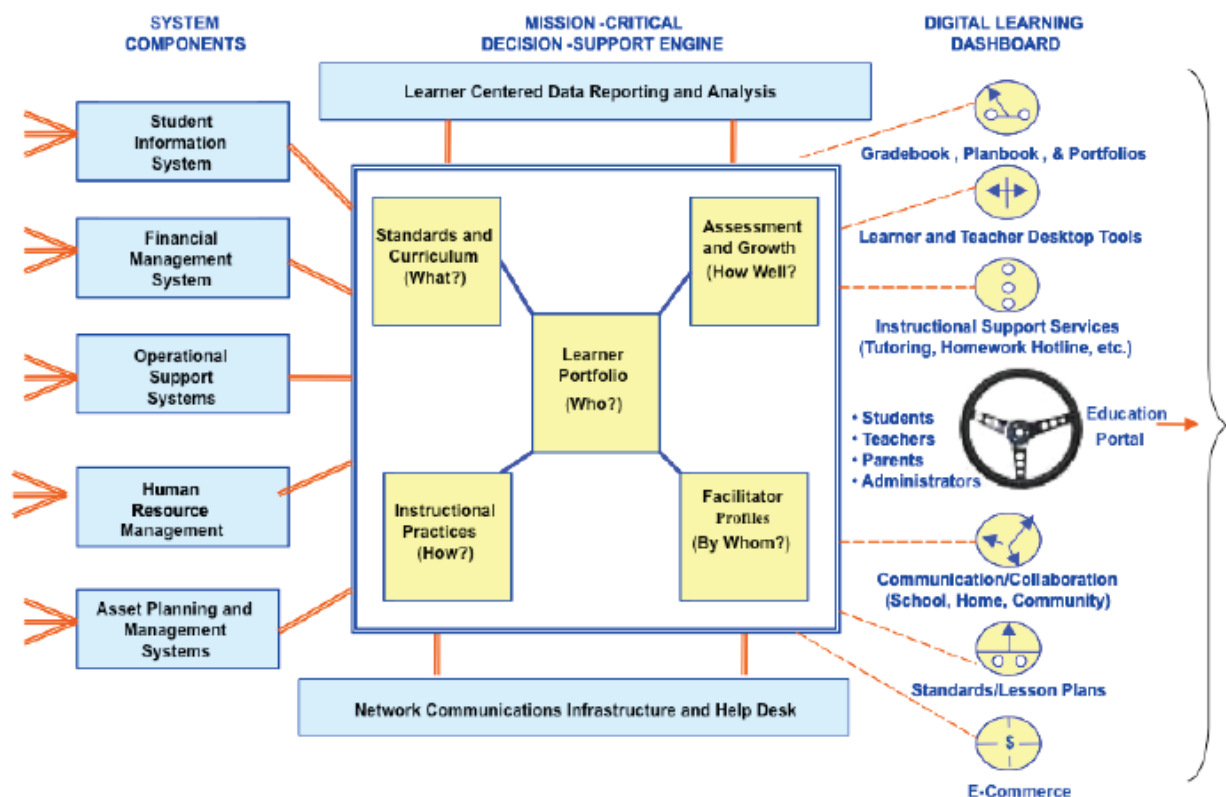

Figure 10: Modernized Framework of LMS (Jhon Phillipo, 2012)

WAYS TO IMPROVE LMS

As with the increase and diversity in business and education fields the demand for LMs systems has been increased. E- Learning is the major factor behind it and its demand has been increased significantly over the past few years. The advancement in mobile technologies and internet networks has helped to create a learning environment that is remote and available on the go. In this scenario the demand of LMS has been increased. With the implementation of LMS systems new demands for features are being introduced. Some of the enhancements that can be introduced for the improvement of LMS systems are as follows (LMS, 2011)

- Integration of LMS systems in the collaborative software platforms and introduction of messaging frameworks. This can help to improve the communication of users in LMS. For instance programs like Salesforce and Zendesk are significant examples.

- Introduction of cloud technologies in the LMS systems. Cloud technologies are highly important these days. Many multinational organization are migrating their data storage to network based methods. So it is a need to take LMS to the level of cloud computing.

- LMS can be integrated with talent management softwares for better application in business organizations.

- With the advancement of smartphones and smart watches wearable technology is been the focus of today's technological development. So there is a need to take LMS to that step and integrate it with wearable technologies.

- Biometric and Facial recognition engagement tracking can be introduced in LMS to make it more secure and advanced.

BOTTOM LINE

Hence CPD can play an important role in the field of education, teachers can adopt it to develop their professional skills and excel in their careers as well as students can take it up to improve their learning skills and productivity to acquire good grades in their educational life.

CHAPTER 7

METHODOLOGY

To carry out our research about LMS System we had to devise a methodology to move the war forward. We devised the following methodology.

STEP 1:

A public survey was conducted through a questionnaire carrying thirty eight different questions about LMS and its problems. This questionnaire was made on Google docs and link was floated to the friends and acquaintances circles which are students of different universities through email. They were requested to fill up the questionnaire. (Appendix I) The students were asked about their Gender and their university name. No other personal information was asked. They were given a scale of 1 to 5 for every question. Where **1 indicates Strongly Agree** and **5 indicates Strongly Disagree.** About 150 responses were recorded.

STEP 2:

After the survey was conducted the responses were noted down in an excel sheet. Now we develop research questions we want to get answers about. In this case we developed two research questions regarding LMS system. After developing the research questions we will develop two complementary hypotheses against each question that we have to accept or reject after the analysis of the data collected.

STEP 3:

 After setting up the hypothesis we will analyze the collected data through the statistical software called **IBM SPSS.** We will input the values of the data collected in the SPSS software according to the questions that we want to research and will try to analyses the frequency, mean, median and correlations of the data entered. For this purpose we will initialize the input and output variables to feed into the software that will provide us the necessary required results.

STEP 4:

After the analysis we will counter check our built hypothesis and will compare the results in the light of the assumed hypothesis. The hypothesis that is in accordance with the results and findings of the IBM SPSS analysis software will be accepted and the contradictory hypothesis will be rejected. In the light of the accepted hypothesis that in this case is that the existing LMS system needs reforms and needs to be modified.

STEP 5:

The next step after accepting the suitable hypothesis is to devise the future frame work for the development of new LMS system that can satisfy the needs and requirements of the students and can prove more effective and efficient than the existing LMS systems. We will discuss the frame work in detail listing all the important and necessary features the current LMS system lacks in and that are included in our devised LMS system

STEP 6:

The final step is to develop a layout of the new existing system. The detail of the new model, its structure and framework will be given in detail. We will try to devise a new LMS model that can satisfy the needs and requirements of the students and the users in the light of the feedback recorded from their responses. We will try to include all the necessary features we feel are important for creating an improved and much efficient LMS system.

CHAPTER 8

DATA ANALYSIS & DISCUSSION

RESEARCH QUESTION ONE (RQ1)

How much the existing LMS are satisfying the needs of the users of students?

The answer to this question is will give us the detail and will help us to identify the level of satisfaction of existing LMS systems as a tool in students' learning life. We would be able to evaluate that how much existing LMS systems are helping students in their learning process. It will also give us the idea that either LMS system is considered an important tool of today's learning techniques or just an optional, show off technique. It will also enable us to know that the percentage level of students and instructors/teacher who think that LMS and its features are effective. In the end the most important point is to know that how much the existing LMS system helping students as a tool in their overall academic performance. Is it providing the exact information what a student needs? Is it providing the right information on the right time? Does the existing LMS system providing information relevant to the job? Is the provided information sufficient? Is the provided information up-to-date and is easy to understand?

All these leads and critical questions can only be answered by carrying out a detailed research on existing LMS systems. The analysis will help us to identify that how much existing LMS systems are satisfying the students' needs.

RESEARCH QUESTION TWO (RQ2)

Existing LMS systems are user friendly? Is there a significant need to improve the features of LMS to make it more effective for the users?

It is important to identify by analysis that how students feel about the existing LMS systems when it comes to being user friendly. It is because for a system having high level of satisfaction, it is important to be highly user friendly. We also have to analyze the satisfaction level of existing LMS system. Does the LMS provide interactive features between users and system? How much students think that there is a need of improvement in the existing LMS system by adding new and advanced features to meet the learning needs. Students' response is important to know if they feel well satisfied about existing LMS system or think it needs

improvement. In case of any improvements we have to further see and analyze how much it will increase productivity in the learning process. After implementing necessary improvement features how will the LMS system take shape weather it would be still an optional resource or a necessary tool of learning? ? How much impact it will create over all in the learning process and what important features might be needed to create such a positive impact.

To address all these important questions we have carried out research and analysis. For this research we have built a questionnaire using Google documents carrying different questions about LMS systems. The link of the Google document questionnaire is as follows:

For analysis and research we designed a questionnaire comprising of thirty eight questions and distributed this questionnaire among our circles of friends and acquaintance. The questionnaire was distributed through email to the students of graduate and masters level. They were asked differed questions regarding the performance of LMS system. Mixed universities were selected for this survey, mainly universities of science and technologies, medical universities, arts, social sciences and cultural and architectural design institutions. The purpose of selecting mixed university students was to get a mixed response regardless of being subject or field specific. It will also give us an insight that response about the LMS system is either same or differs according to the discipline.

SETTING

For the analysis and research of these questions a questionnaire was built on Google documents the link is:

(*https://docs.google.com/forms/d/e/1FAIpQLSf-VjJ-p90hW34nHCtlO4s0UrtYjf97vkH5MHt7E6YtbiHr8A/viewform?c=0&w=1*)

This questionnaire was floated among the students of different universities of graduate and Masters Level through email and their response was recorded on various questions regarding LMS. These universities include engineering and technologies universities, universities of arts and social sciences and universities of culture design and architecture. As well as response from medical universities were also recorded. The aim was to get a mixed response not field specific. That would help us to analyze further the significance of LMS in different disciplines of courses are same or it varies.

SAMPLE SIZE

The research was conducted through participation of 150 students from various universities of Pakistan. So the recorded sample size is 150. The survey was an email based survey floated to the students of different courses and different universities (**NUST, COMSATS, AIR UNI etc**). In our surgery the age of the sample population was ranging from 18 to 25 year including both male and female. They were asked to give their response through email using the Google Doc questionnaire. The questionnaire had thirty eight different questions regarding existing LMs systems. They also have to mention their university name with the form. The questionnaire was to get a comprehensive feedback from the user about LMS. The options were made from the scale of 1 to 5 where 1 being "**Strongly Agree"** and 5 being "**Strongly disagree".** All answers were made compulsory and for any other comments from the users a comment box was provided.

HYPOTHESIS

We will now make our hypothesis to continue of research analysis further.

For **RQ1**

We develop a hypothesis that existing LMS systems are not satisfying the needs and demands of the students considerably. It is kind of an optional facility for the students. There is a high requirement to reform our existing LMS systems to meet the student satisfaction level.

The above hypothesis is denoted by h0

On the other hand, we develop a complementary hypothesis to h0 that states that existing LMS systems are satisfying the needs and demands of the students considerably. It is kind of a necessity for the students these days. There isn't much requirement to reform our existing LMS systems because it is satisfying the needs of the students effectively.

This hypothesis is denoted as h1.

For **RQ2**

We develop a hypothesis that existing LMS systems are highly user friendly; therefore the improvement in features of existence LMS systems is not needed. The students are satisfied considerably by the current LMS systems. There is no need to add more features to LMS systems because it would not make any difference in the effectiveness or impact of LMS in the learning process. So adding more features would be a futile exercise.

This hypothesis is denoted by h2

In negation to the above mentioned hypothesis h2 another hypothesis is developed that states the existing LMS systems are not much user friendly. The students are not much satisfied by the existing LMS systems. There is a need to introduce new features in existing learning management systems to make it more effective. The existing learning management systems have not been up to the level of effective learning. In order to achieve the effective learning target existing LMS system has to be revolutionized based on new techniques and modern needs of the students. This will help to maximize the impact of LMS system and increase their significance in the learning process.

This hypothesis is denoted as h3

VARIABLES

To carry out our research and analysis on the above mentioned hypothesis we need to identify the variables which we will put in the Statistical Package for the Social Sciences (**SFFS**) software for logical batched and non-batched statistical analysis. Our identified variables would be the input for the software.

INDEPENDENT VARIABLE

In this case we will take students as an independent variable and denote it by **"STUDENT Gender".** The students are considered as an independent variable because their responses are not influenced by any other element in the hypothesis or research. They are free and independent to make their choices and decision and recorded their response with their own free will.

DEPENDENT VARIABLE

In this case we will take the LMS program as the dependent variable and denote it by **"LMS".** For analysis we define two dependent variables one is "**LMS Satisfaction Level**" the other is "**LMS User Friendly Level**". The first variable will represent the level of satisfaction of the users with the existing LMS programs and the second one will show the level how much an existing LMS system is user friendly. The LMS program is considered to be a dependent variable because it is actually an object or a tool used by students or teachers as a source of communication. It is a software program it can't implement itself or influence any other element mentioned in the hypothesis i.e. students or teachers on its own. This

program is dependent of users if they want to use it or not and how much frequently they want to use it.

SOFTWARE ANALYSIS

We used the SPSS software to analyses the results of the survey conducted over 150 students responses were recorded, the results of the analyses of the software are as follows. We took student's gender and the LMS level of satisfaction and user friendly level as variables. For Gender data values of 1 and 2 were used in which 1 represents Male and 2 represents female. For LMS variables there were 5 values defined. 1 stands for Strongly Agree, 2 for Agree, 3 for Neutral, 4 for Disagree and 5 for Strongly Disagree.

FREQUENCIES

Below is the detailed frequency table after the SPSS software analysis. From the frequency table we can see that out of **147** responses collected **54** were males and **93** were females. Similarly the ratio of male to female is 63.3 to 36.7 in terms of percentage.

Table 3: Frequency Table

Student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	54	36.7	36.7	36.7
	Female	93	63.3	63.3	100.0
	Total	147	100.0	100.0	

Satisfaction Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	11	7.5	7.5	7.5
	Agree	10	6.8	6.8	14.3
	Neutral	11	7.5	7.5	21.8
	Disagree	87	59.2	59.2	81.0
	Strongly Disagree	28	19.0	19.0	100.0
	Total	147	100.0	100.0	

User Friendly Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	20	13.6	13.6	13.6
	Agree	4	2.7	2.7	16.3
	Neutral	9	6.1	6.1	22.4
	Disagree	88	59.9	59.9	82.3
	Strongly Disagree	26	17.7	17.7	100.0
	Total	147	100.0	100.0	

Table 3: Frequency Table

Now coming to the dependent variables frequencies; for the Satisfaction Level of existing LMS systems we got the following responses adding up together we got **21** responses that Agree or that are satisfied with the existing LMS systems. **11** students are neutral in this case and remarkably high frequencies of about **115** either disagree or strongly disagree or in other terms we can say that they are unsatisfied with the existing LMS systems.

Similarly taking the look at the second dependent variable that is User Friendly Level for existing LMS systems we note that **24** out of 147 responses of the students are of the view that the existing LMS systems are highly user friendly. **9** students out of 147 remain neutral in their stance. Again we recorded **114**students who are of the view that existing LMS systems are not much user friendly.

STANDARD MEAN

After the detailed analysis of the frequencies we will look at the standard mean of the variable through SPSS software. Form the results below we can see that the standard mean value of the level of Satisfaction for the existing LMS system came out to be **3.75**which is close to the value of 4. The value of 4 represents Disagree as mentioned above. Therefore we can conclude that the target audience whose responses were recorded isn't much satisfied with the existing LMS systems.

Now taking a look at the level of existing LMS systems being user friendly we see that the standard mean value comes out to be **3.65**which is slight less than what we recorded in case of level of satisfaction of the existing LMS systems but is still close to value of 4 which represents Disagree. Hence we can say that the students mostly think that the existing LMS systems are not much user friendly. Details of the results are as follows.

Table 4: Standard Mean Value

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Satisfaction Level	147	4.00	1.00	5.00	3.7551	.08879	1.07647	1.159
User Friendly Level	147	4.00	1.00	5.00	3.6531	.09969	1.20872	1.461
Valid N (listwise)	147							

Report

Student		Satisfaction Level	User Friendly Level
Male	Mean	3.6667	3.6296
	N	54	54
	Std. Deviation	1.14924	1.36391
Female	Mean	3.8065	3.6667
	N	93	93
	Std. Deviation	1.03481	1.11641
Total	Mean	3.7551	3.6531
	N	147	147
	Std. Deviation	1.07647	1.20872

CORRELATION

Getting further analysis from the SPSS software we use co relation between the variables to see their relation. The correlation further strengthens the previous results we witnessed in mean value and frequencies. We can see in the detailed table below that student to satisfaction level of existing LMS systems is **.063** and with the level of user friendly is **.015**. This means that students are not much satisfied with the existing LMS systems as well as the

Table 5: Correlations

Correlations

		Student	Satisfaction Level	User Friendly Level
Student	Pearson Correlation	1.000	.063	.015
	Sig. (2-tailed)		.450	.859
	N	147.000	147	147
Satisfaction Level	Pearson Correlation	.063	1.000	.629**
	Sig. (2-tailed)	.450		.000
	N	147	147.000	147
User Friendly Level	Pearson Correlation	.015	.629**	1.000
	Sig. (2-tailed)	.859	.000	
	N	147	147	147.000

**. Correlation is significant at the 0.01 level (2-tailed).

level of it being user friendly because the values of the correlations are close to zero.

ACCEPTING THE HYPOTHESIS

Now we will analyze our initial developed hypothesis in the light of the results obtained by the software and will accept the hypothesis that is in accordance with out tested results.

For **RQ1**

We developed a hypothesis that existing LMS systems are not satisfying the needs and demands of the students considerably and denoted this hypothesis as **h0.** On the other hand we developed another hypothesis that states that existing LMS systems are satisfying the needs and demands of the students considerably and denoted this hypothesis as **h1.** As from the Standard mean value in case of level of satisfaction is **3.75**and value of correlation is **.063** also the highest no of frequencies came out to be for 4 which is termed as Disagree so we accept the hypothesis h0 in the light of the results obtained and reject the hypothesis **h1**. We can say that existing LMS is not satisfying the needs of students considerably.

For **RQ2**

We developed a hypothesis that existing LMS systems are highly user friendly; therefore there is no significant need to improve the features of LMS to make it more effective for the users. We denoted this hypothesis as **h2.** Secondly, we developed another hypothesis that the existing LMS systems are not much user friendly; there is a significant need to improve the features of existing LMS to make it more effective for the users and denoted it as **h3.** In the light of the tested results we got a standard mean value against the level of existing LMS systems being user friendly to be **3.65** and its correlation to be **0.015.** Moreover the highest frequency in this case was of option 4 that shows disagree. From these values we can clearly accept the hypothesis **h3** and reject **h2.** We can state that existing LMS systems are not much user friendly and needs improvement.

CHAPTER 9

PROPOSED SYSTEM &FUTURE WORK

From the above analysis we can propose that much future work is needed to reform the existing LMS software system to make it more users friendly so it can satisfy the needs and demands of the students much effectively. We will devise an LMS system that can have improved features and that can help the students to work more effectively.

DEVISED LMS MODEL

We will devise the new model first by taking in view the requirements of students an LMS must fulfill. We will discuss the new devised LMS system and its features in detail. Below is the pictorial representation of the new devised LMS model.
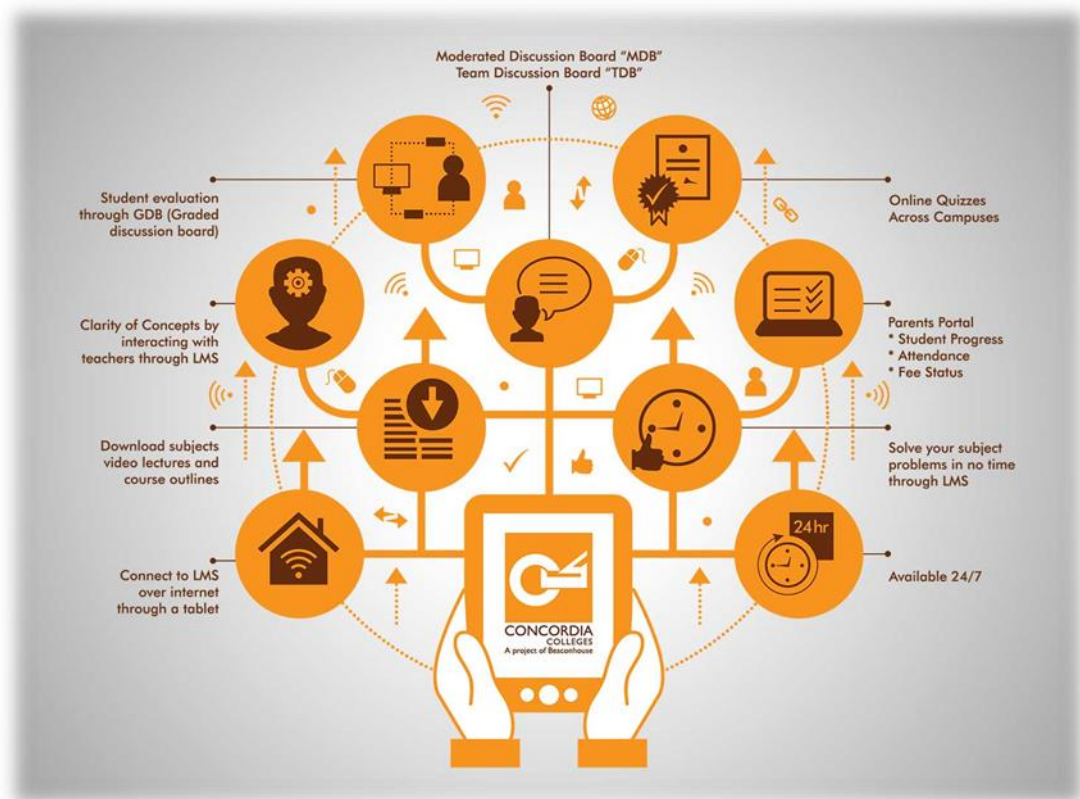

Figure 11: LMS Model (concordia, 2015)

Following are the features of the new devised LMS system.

1. **Course Content Management**

The new LMS system should allow and support the users including both the students and the teachers some storage space for personal files so they can upload it when necessary. This system should be able to support the Course objects sharing and reusability of the previous uploaded content. There is also a need to design a digital library that would help in sharing of information between the users.

2. **Evaluation**

The LMS system should allow the student to evaluate the course on the completion of each course. The answers of the exams like MCQs etc should be uploaded on LMS for self-evaluation of the students and should be checked by the teachers too.

3. **Communication**

There should be a system integrated in LMS system for texting or chatting so that the user can interact with each other on LMS in this regard forums can be build up using wikis or any internal message system can be developed for effective communication.

4. **Progress Monitoring**

The new LMS system should be capable of tracking the overall progress of the students and that can be viewable by the teachers and the parents through their log in ids. In this regard a proper grade book should be maintained which show the progress of the students in detail in course and semester wise viewable for teachers, students as well as parents.

5. **Administration**

Features of administration should also be integrated in the new LMS system in this regard we can use it like; that before the enrolment of a student in any course his/her eligibility can be checked through this administrative feature. Different accounts can be made on the LMS system according to different user and their different role for instance separate accounts for Students, Teachers, Admin Staff and Parents can be allotted with exclusive permissions accordingly. The availability of material of courses and its content rest with the individual who is maintaining the course.

6. **Third party integration and support**

For simplified integration there is a need to develop a system that is compatible with third party systems. In this view the system should support the common standards and frameworks i.e. AICC, IMS, and SCORM. The new LMS system should be compatible with multiple hardware and software platforms and should be able to run on it easily without any compatibility issues.

7. **Third Party Content Support**

The new LMS system should have the capability to support third party file and media formats like MP3, Flash Flv, MP4 AVI and other video formats. It should have also the capability to adopt and install new third party formats.

8. **Usability**

The new LMS system should be highly user friendly and easy to use also it can contain tutorials for easy learning of the system and its features. The system and its features should be fully accessible though the web browser.

9. **Configuration and modification**

The source code of the LMS system should be available for the administrators so that they can configure the system and modify it according to the requirement. The administrators should have access to API or SDK.

10. **Technical requirements**

The system should be redundant and also have the capability to manage heavy loads of work. It should able be able to handle the growth in number of users and information. A strong infrastructure is needed to support this new system. The new system should support the support interactive course content object.

FRAMEWORK

For improving the LMS system and make it more efficient we will look at the new features that can be incorporated in the LMS system to make it more efficient and effective. Following are some features.

- Learning Content Manager

- Course Manager
- Content Assembly Tools
- Catalog Manager
- Learning Planner
- User Profile Manager
- Collaborative Environment
- University Consortium Manager

We can divide the new LMS into two main segments Learning Content management System (LCMS) and Learning Management system (LMS). The LCMS segment covers the segment of the program which deals with the content management of the LMS system by the users like creating forms, uploading files manage and store data files. The other segment of LMS is responsible for user and administration management.

PHASES OF LMS SYSTEM

We can categorize the new LMS system into three phases which are as follows.

- ➢ Layout
- ➢ Database
- ➢ Web Services

LAYOUT

The web application, their designs and services are the main part of this phase. PHP is the main tool in designing the system code which is used as the scripting language. As PHP is an open source programming language so the programmers would have access to the source code of the LMS and can edit it according to the needs and requirements. PHP is server side powerful programming language and is easy to use and to code in and is efficient on multi-platforms. Also it isn't a heavy programming language and is easy for servers to handle too. It has its own but in memory space during an execution on a program it uses its own memory space reducing the work load of the server and saving time and processing speed.

DATABASE

Database actually connects the program to all the other modules and available resources. In this LMs system My SQL is used for database. My SQL is also an open source database management system which is easy for the programmers to edit and work with according to

the needs and requirements. It is used to introduce features of add, insert and modify information in data bases.

WEB SERVICES

In most database actions we have to use web services as a reference. This is carried out under this phase. For instance, the data operation, management and handling are carried out using the web services. To perform specific functions or actions different web services are developed. Web services works a bit same as a LAN network works in function; which is to allow it to connect and work with other available system on the internet. This helps the system to gain greater flexibility. For data transmission from different sources web services used XML to carry out the communication. Hence we can say that web services act as a connectivity tool which is capable of passing objects, data sets and cached objects on different servers.

After giving the framework we will focus on the main points this new LMS system must carry.

➢ Interactive features like chat, discussion forums, email or message should be given importance and should be highlighted for the user to use them frequently.

➢ Accessibility of LMS system through mobile devices is highly recommended also integration with the wearable technology is recommended.

➢ Android or iOS applications should be developed for LMS system to keep the student connected with LMS like they are connected with Social networking websites i.e. Facebook and Twitter so that they can get notifications about the works, assignments exams and results on a faster pace.

➢ Active feedback method to be introduced for both students and teacher where necessary.

➢ Security features like biometric access or face recognition techniques can be introduced.
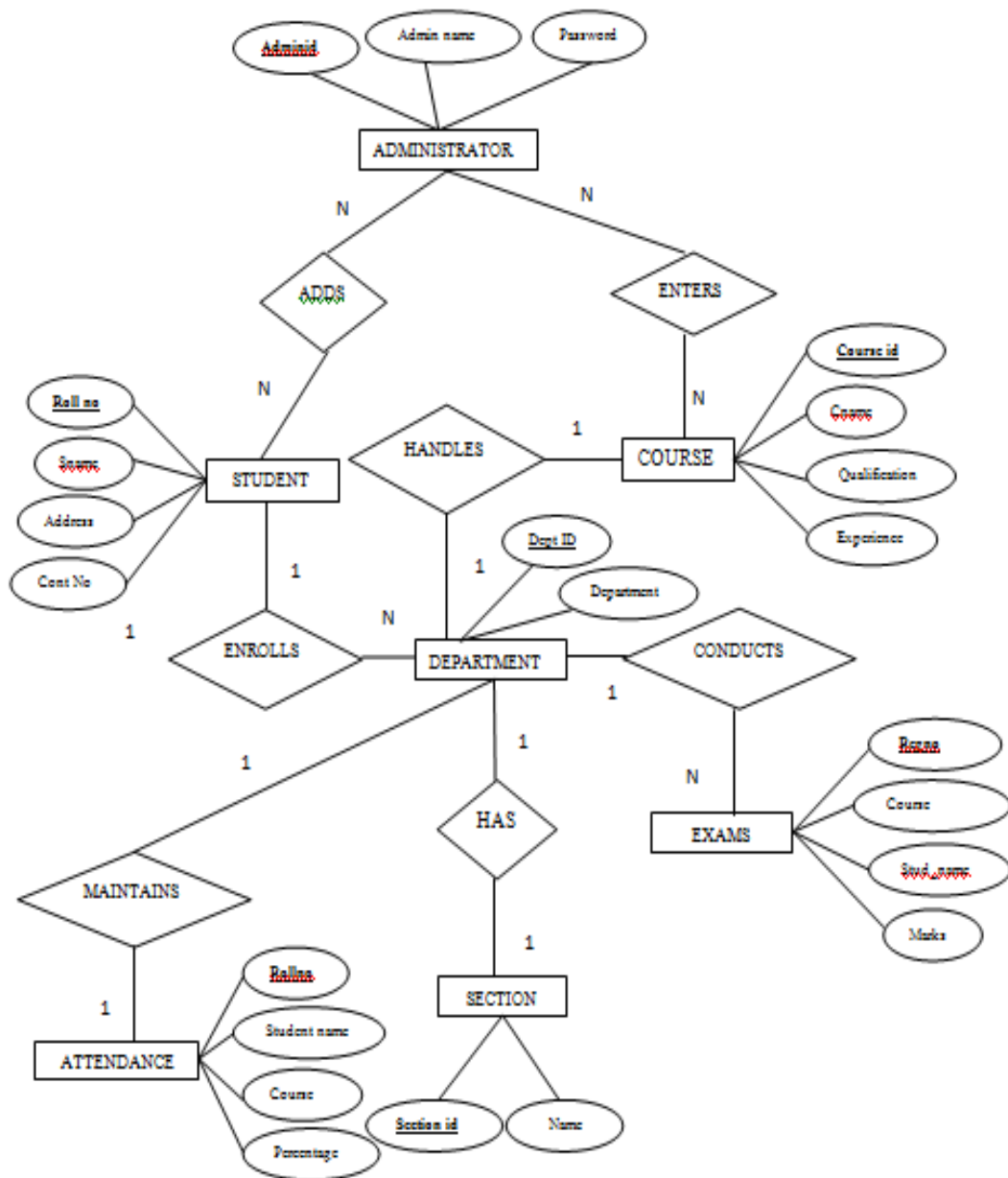
STRUCTURAL DIAGRAM

Figure 12: Structural Diagram
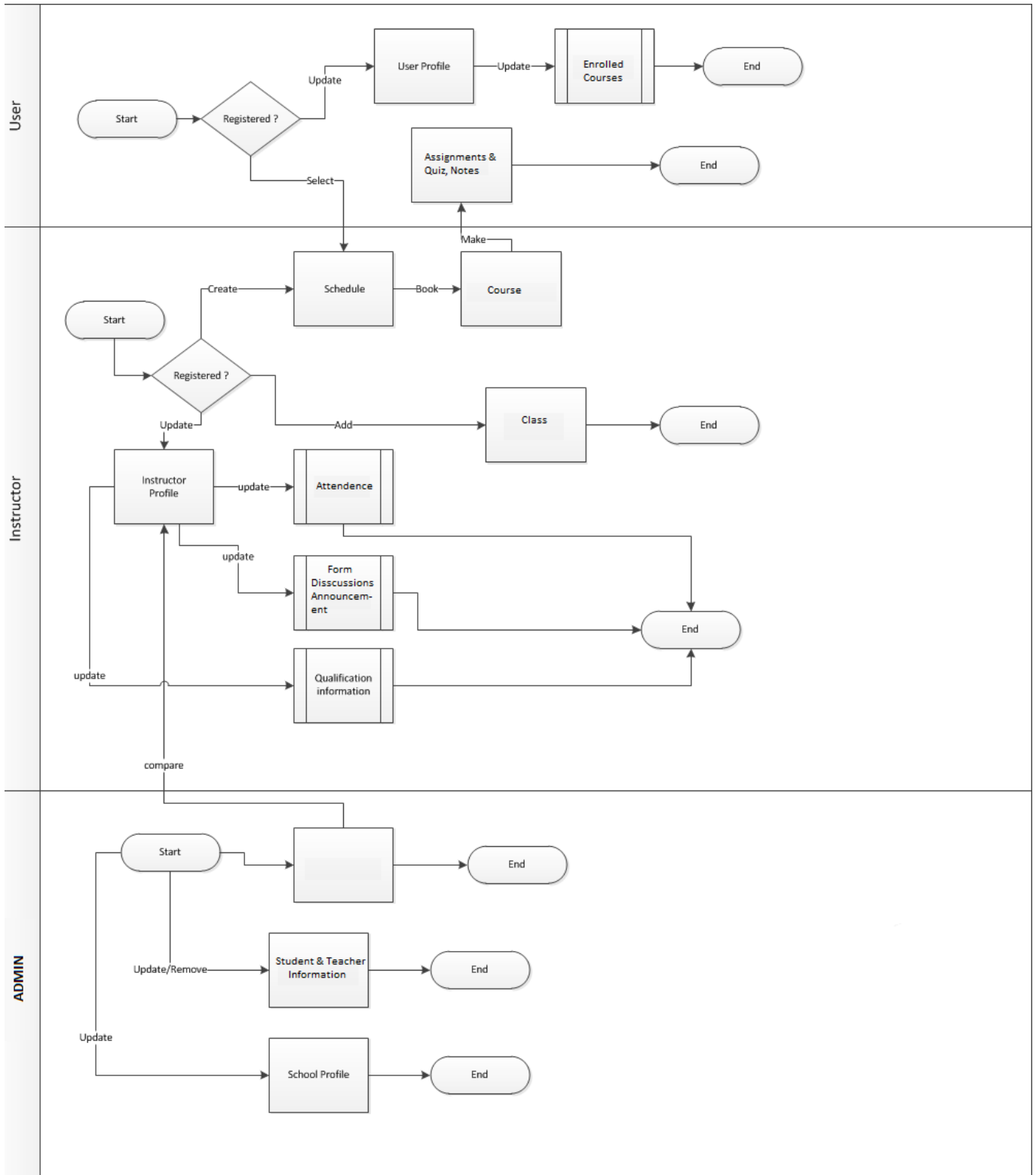
PROCESS FLOW DIAGRAM
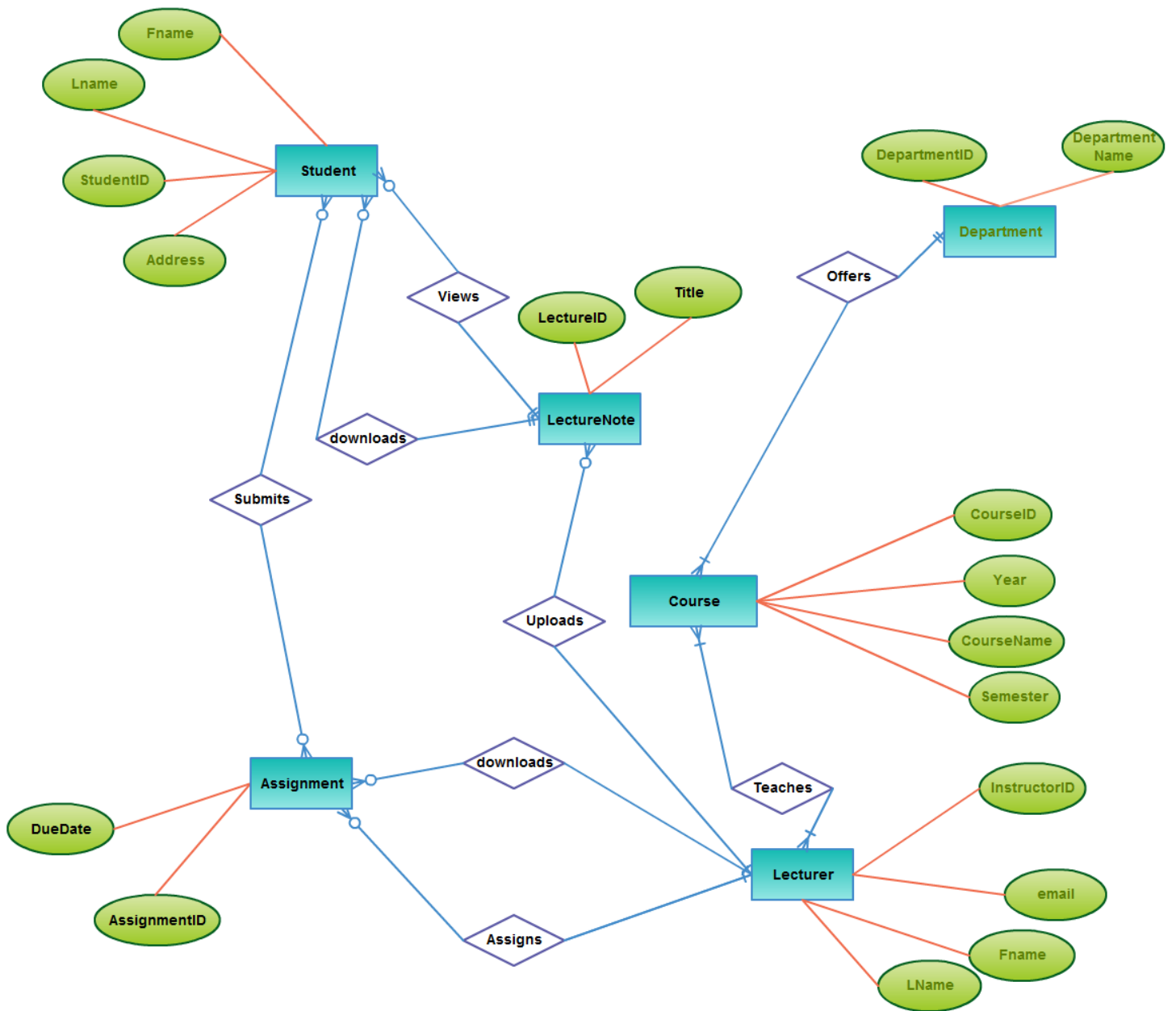
ER DIAGRAM OF LMS SYSTEM

Figure 14: ER Diagram of LMS System

CONCLUSION

As in this age of internet technology and lifestyle is improving day by day. Same out learning techniques and conventional teaching methods are changing too. The educational institutions are more focusing on e-learning. It was also noted by the responses of the students that the LMS system lacks some features and is not much user friendly. There is a need to incorporate it with new improved features to make it more effective and easy to use system for students and teachers. We tried to propose an improve model that can be much user friendly and make things much easier for the users. It is not only an efficient system but focus more to gather the attention from the users so they can use it better and find it more user friendly. It could satisfy much of their needs involved with e learning.

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APPENDIX I

LMS PROBLEMSQUESTIONNAIRE

Gender *

1. Male
2. Female

University Name *

[   ]

Questions

1. The LMS provides high availability *
2. The LMS is user friendly *
3. The LMS provides interactive features between users and system *
4. The LMS provides high speed information access *
5. The LMS provides high speed information access *
6. The LMS provides information that is exactly what you need *
7. The learning system provides information you need at the right time *
8. The LMS provides information that is relevant to your job *
9. The LMS provides sufficient information *
10. The LMS provides information that is easy to understand *
11. The LMS provides up to date information *
12. Using the LMS would allow me to accomplish learning tasks more quickly *
13. Using the LMS would enhance my effectiveness in learning *
14. Using the LMS would increase my productivity in learning *
15. My interaction with the LMS is clear and understandable *
16. Getting the information from the LMS is easy *
17. I frequently use the system *
18. I only use the system when it is absolutely necessary for learning *

19. The LMS helps the organization enhance competitiveness or create strategic advantages *

20. The LMS helps me to achieve learning goal *

21. The LMS has clear targets to achieve *

22. The LMS helps in providing feedback to students on assignments *

23. The LMS help instructors in communicating with the learners *

24. The LMS has effective progress and work flow up tools *

25. The LMS plans are clear and predefined *

26. Using the LMS has made managing my courses easier *

27. The LMS has student effective training tools *

28. The use of LMS provides a space where learning can take place independently *

29. Manual guide provides sufficient information to the student about how to use LMS *

30. University providing training course that will make the student able to use the LMS *

31. Training material enough for the teacher management course on LMS *

32. The LMS helps student to reflect on daily lecture *

33. The LMS helps student to reflect on his/her learning *

34. The LMS helps student to reflect on teacher's knowledge on regular basis *

35. Student can take test or quizzes to evaluate information they have learned *

36. The LMS provide guide to help instructors on their achievement of course learning objectives *

37. The LMS provide forums to discuss lectures on regular basis *

38. The LMS forum encourage participation of students and instructors *

Options:

1 Strongly Agree

2 Agree

3 Neutral

4 Disagree

5 Strongly Disagree

*Required Answers