E-Learning as Paradigm

Aleksandar UGRINOSKI[1], B.Sc.

1. Introduction

The traditional concept of training gradually loses the dominant role it has had so far. The new learning paradigm is called E-Learning and it is based on the wide spreading of Internet services and on the fall of their prices. The possibility of applying E-Learning in great systems, as an intranet solution based on VPN technology or as a public portal available to everybody under certain commercial conditions, and the possibility of training and educating employees in various thematic fields (management, IT, foreign languages, various business skills etc.) has made this method become the most prospective of methods in the field of education and professional development.

1.1 The Traditional Concept - Classroom training

1.1.1 General Characteristics of the Concept

Classroom training or ILT (Instructor Led Training) is a classic synchronic concept of learning, which demonstrates its greatest value in the social element of its environment, as well as in direct communication and interaction with the lecturer. It is a acknowledged that learning is a social process, and hence the social aspect of the classroom is the greatest advantage of this traditional approach. Users are among peers because they are all in a same position - they have come to learn. Asking the peers from the nearest desk to help or explain something is a normal and legitimate part of the learning process in a classroom. So is asking the teacher - that is what teachers are for. Yet, Classroom Training in our world of ever faster processes, and therefore ever faster learning, has hit its limits. The average employee, perplexed by the continuous chain of his "To Do" list, finds it hard to organise his duties in order to be able to find a week or two for learning.
Moreover, larger systems, such as telecommunication companies, state institutions like the Civil Servants' Agency, commercial companies and industries etc., need equal and balanced training for their employees in various offices, which requires the various partners to laboriously coordinate each other, oftentimes unsuccessfully.
Furthermore, the classical concept is inflexible when sudden changes occur, postponements or cancellations - classes always begin at a specific time etc.

1.1.2 Costs

Learning in classrooms objectively yields the highest quality of education - but it is also the most expensive because it has an inherent structure of fixed expenses: premises, equipment (that needs constant upgrading and improvement), as well as trainers whose development is extremely expensive, and most often the classrooms remain half empty. As far as exclusive seminars or training sessions are concerned, the participants must travel, as the smaller communities cannot afford to organise such unprofitable programmes.

1.2 The future of classrooms, teachers and the hybrid model

The future of the classroom is certain: it will remain with us. However, there will be fewer, and users will spend less time in it. It will find its place in the so called hybrid model, which unites learning in classroom and learning through Internet. Practice has shown that this model yields best results.

---

[1] Information Technology Logistics State Advisor, Civil Servants Agency, Skopje, Republic of Macedonia

1.2.1 Shorter and better quality training

The following is one variant of the hybrid model: participants come to the classroom for a day in order to meet their group, the trainer or mentor, as well as the E-Learning technology. Then, they learn alone, at their own pace, with the help of their mentor and their peers from their real or virtual class. This variant is applicable where there is a classroom nearby. It is particularly acceptable for the trainees whose knowledge of computers is limited. The reverse variant of the hybrid model will press for learning before and after classes by means of technology. This will be applied in the training of well educated and skilled users who will need some "in live" work where the content requires it, for example group work etc.
Classroom work will evolve. Increased use of simulations and other E-Learning resources in the classroom are anticipated. It is certain, for example, that testing technologies developed for E- Learning will be used.

1.2.2 Virtual Classes

Virtual classes will be developed around the classroom. In time, users attending this course, who will meet in the real or the virtual classroom, will develop a practice of mutual contacts and assistance by means of some well known and common ways of electronic communication (e-mail, chat, news groups, instant messaging).
One characteristic of E-Learning is that the monitoring of the trainees in the classrooms is attractive. This concerns the administration of the trainees in classical courses. This way, both groups will be united - to the delight of the HR services in large companies, which always experience problems related to planning and record-keeping concerning their trainees.

1.2.3 Turning Lecturers into Mentors

All of the above suggests that lecturers will gradually become mentors. This means that their skills to communicate in the virtual world will become of greater significance, while communication during immediate class-work will become less prominent. However, one needs to be careful here; the need for the classical way of working in a classroom will never disappear and, therefore, each mentor will at all times have to be prepared to face the class in a real classroom and give a quality lecture.

2. E-Learning

2.1 Advantages of E-Learning

'The next "big killer" Internet application will be education. Education through Internet will be so big sensation that would make the e-mail look like a mistake in circling'[2]
The sudden surge of asynchrony forms of learning on the global market, E-Learning above all, (mostly on the American, and increasingly on the Western European), can be linked to some of the key advantages that E-Learning has in comparison with classical classroom learning. E-Learning enables the trainee to choose independently the place, the time and the length of individual learning sessions. Furthermore, it allows distance learning for trainees who might find travelling either too expensive or too inconvenient. Thirdly, E-Learning provides large users with a standardised and an affordable framework for short training of more employees or for long training but on different locations etc.
However, the classical training will not cease to exist, as it provides quality and amenities that can hardly be achieved through technology, but such training will remain dominant in programmes with greater additional value (e.g. where exceptional knowledge by the trainer and intensive interactive communication with trainees are required) or in circumstances when the trainee population has greater difficulty in accepting the concept of E-Learning technology.

[2] John Chambers, CEO Cisco Systems

Projections about the US market[3] show that there will be further growth of E-Learning application. The same projections apply to the European market, though with a few years of delay.

** Graphic 1 **
The development of the corporate E-Learning market in the USA in the 1998-2003 period

The current number of Internet users in Macedonia, and particularly their increasing number, shows the moment when a broader implementation of the E-Learning solutions becomes cost effective and remunerative.
It is also interesting to look at the competition[4] between various forms of technology based learning.

** Graphic 2 **
Domination of Internet in technology based education

Again, it can be seen that E-Learning - learning through Internet, that is - is an absolutely dominant trend that will push all other applications out of the market (Video, CD ROM etc.).

2.2 Key triggers of using technology for learning

The following are the key driving motives for the increasing use of E-learning by western organisations in the process of training their employees:

- **Time of employees**: organizations are likely to offer their managers and staff options to chose the time for learning. They also want to improve on achievements of Classroom Training after the classroom sessions;
- **Speed of implementation**: organizations want to distribute learning process faster within the organization itself, especially in times of major organizational or technological changes;
- **Distribution**: possibility for distribution of unified content, implemented on the same level at the same time within the organization, regardless of the geographical dispersion, is a big advantage of this technology;
- **Reducing logistic costs**: reducing the travel costs and accommodation for employees at the location where the training is carried out. According some researches[5], total costs can be reduced up to 50%-70%;
- **Granulation**: possibility of multiplied implementation in smaller modules.

2.3 E-Learning Implementation Areas

Researches[6] in some major world corporations applying E-Learning as Internet/Intranet solution for training of their employees, show that E-Learning is implemented in various areas (with the most important such as: management, IT, personal capacity development, selling, project leading etc.).

** Table 1 **
Implementation Areas of E-learning Model

Therefore, it is necessary to underline that IT is not the only area to apply learning though Internet, but it is not even the leading one! In other words, researches have shown and proved the great potential this new technology provides, practically in all areas in the learning process. Not to mention the potential of this application for a life-lasting learning, nowadays generally accepted educational model.

[3] International Data Corp. 2000
[4] International Data Corp. 2000
[5] Training Magazine 2002
[6] High Impact E-Learning Strategies, Melcrum Research 2002

3. SCORM (Sharable Content Object Reference Model)

It is generally acknowledged that certain standards defining the 'rules of the game' must be imposed to any area of common interest, in order to have more efficient use and development of the same. Since the very beginning of the idea of E-learning, there have been a number of attempts to introduce standards, but the SCORM (Sharable Content Object Reference Model) has been worldwide accepted. The SCORM standard has been promoted by ADL[7] (Advanced Distributed Learning) – initiative group of the USA Ministry of Defence.

3.1 SCORM philosophy

The basic idea of the SCORM standard is to define rules to create endless valued contents to facilitate mass use of the same on various platforms and from variety of providers.
Key aspects of the standard are:

- Multiply content reusability;
- Interoperability of different systems;
- Contents' accessibility for different vendors;
- Durability.

3.2 SCORM architecture

SCORM is sublimate of the sections that define the model for collecting contents and the initial environment

** Graphic 3**
SCORM architecture

Content Aggregation Model unifies the Meta Data Dictionary[8], Meta-data XML Binding Best Practice[9] and Content Structure Format[10]. Run-Time Environment consists of Data Model[11] and Launch, Communication API[12].

3.3 Key terms of SCORM

The most important terms in SCORM are: LMS (ceiling structure of E-Learning) and SCO (lesson).

3.3.1 LMS

Learning Management System (LMS) is ceiling application of E-Learning. It covers set of functions designed for delivery, monitoring, notification and administering of the learning content, development of the users, as well as interactions between the user and the mentor and interactions among other users. The content of the application can not be perceived without this complex software. LMS May be used in very simple system, as well as at high complex enterprise-wide distributed environment, such as state administration, large corporations etc. Functions of the LMS (*Graphic 4*) are the following:

3.3.1.1 Registration and Charging

This function processes, checks and authorizes the registration and makes the charges (in cases of public portals) for the user-individual.

[7] www.adlnet.org
[8] from IEEE
[9] from IMS
[10] from AICC
[11] from AICC
[12] from AICC

3.3.1.2 Managing the process

This programme function manages the process of delivery of the training (lecture, module and seminar). The process is as follows: the authorised user vie E-learning launches certain module or seminar. LMS searches for the desired module or seminar and recalls its first SCO (Sharable Content Object). Also LMS allocate the animations of the requested module as well as other stored elements of SCO. Following the final processing SCO recalls the LMS which recalls the next SCO and so on until the end of the requested module or seminar.

3.3.1.3 Testing

The first level of testing is the quiz questions. The second level are tests following certain number of lectures or modules, i.e. the entire seminar.

3.3.1.4 Mentoring and monitoring

Mentoring and monitoring will enable you to run the course, i.e. managing the virtual classroom or the improvement and development of the individual. The Mentor:

- Determines the members of the class;
- Monitors the development of each member of the classroom (based on the tests statistics);
- Communicate with all members of the classroom or individual users.

Monitoring gives basis for creating the statistics. It observes the structure of correct and wrong answers at a level of lecture, module or seminar, which facilitates the tracking of the success of the user. All data are recorded in the database.

3.3.1.5 Users' functions

These functions will enable the user to plan and monitor his/her own development. This is done by virtue of educational chains, communication with the mentor, the coordinator or other members of the group. It also tracks the most relevant statuses of the account, work statistics, as well as auxiliary functions, such as technical support, on-line assistance, dictionary etc.

3.3.1.6 Adminstrators' functions

Adminstrators' functions cover activities, such as control of the content, records and evidence, monitoring and reporting, communication, maintaining the reports/reviews of modules and seminars, maintaining the educational chains, back-up etc.

3.3.2 SCO

SCO (Sharable Content Object) represents the smallest unit of content that can be tracked by LMS. It means that the lesson is always recalled by the LMS. The most relevant characteristic of the lesson is that the lesson must not determine or direct the course, which is logical summary of lessons.

4. Functioning of the E-learning system and future development

4.1 Concept and participants

As a summary of the presented premises and concepts, further in the text I will try to present how does the entire E-learning system function.

** Graphic 5 **
Conceptual Framework of E-learning system

LMS is located at the ceiling of the system. LMS essentially enables all actions in the learning process. Participants (users) from their own virtual classroom using the content management are exposed to the process of learning. Through the module for communication they communicate with other users (from the same or another virtual classroom) and with their mentors. Mentors, via the monitoring module, beside the communication with the participants they also monitor the achievements of the participants in the E-learning.
In order to have all these elements in place, the LMS Administrator needs to make all necessary installations of the content and registration of the participants and mentors.
As a separate segment, surely team/teams exist who are responsible for content development. Usually the team consists of three types of experts:

- Content experts – defines the knowledge to be transferred to the participants (therefore the best solution should be the mentor);
- Design expert – designs the course;
- Tools expert – develops the course in a certain software tool.

4.2 The Future of E-learning

Development of E-Learning is expected to move in the following directions:

- New synchronized learning using audio and video conference;
- Learning “on demand”;
- Expanding to all other areas of interest (management, professional skills, sales and marketing, foreign languages…)

4.3 The role of SCO in the future

Reviewing the concept and the way E-Learning is functioning, it is clear that the main problem for mass usage of the system lies in the content. To be more precise, development of content is extensively time consuming. Some other barriers, such as language are worth mentioning.

** Graphic 6**
The role of SCO in the future

To reduce or to solve the above-mentioned problems, there is a need to define better platforms for content development, which will enable tailored made contents to be designed, developed and provided at any time and any place.

5. The Civil Servants' Agencies Experiences of Practicing the E-learning System

The Civil Servants' Agency of the Republic of Macedonia is an autonomous state organ with the status of a legal entity and with competencies to performe professional, administrative and other activities related to the status, rights, duties and responsibilities of the civil servants.[13] The Civil Servants' Agency is one of the most important elements of the overall public administration reform efforts in Republic of Macedonia. The reform processes are underway and the ultimate objective is to establish professional, efficient, qualitative, apolitical and neutral administration, as a real service for the citizens.

Professional delivery of tasks will directly depend on the level of professional knowledge of the civil servants. Real situations impose the need of permanent training and professional improvement of the staff, aiming to improve the civil servants' education and skills up to the higher level, regardless of their current position within the government hierarchy. Only through permanent education we could improve the level of their professionalism and competency that would provide better governance.

One of the most important responsibilities of the Civil Servants' Agency according the Law on Civil Servants, is the obligation to coordinate the activities regarding the professional development and training of civil servants. Until now, the Agency has organized numerous trainings, seminars, conferences etc., on different topics. Analyses of previously mentioned traditional ways of education show that it is necessary to implement the E-Learning System for Civil Servants, because of all its advantages described above in the text.

After we have supplied and installed the LMS including several contents, few pilot-trainings were organized within the Agency, but mostly for our employees – civil servants. Those pilot-trainings entirely confirmed the expectations of this system. Figures and facts presented by the relevant international researchers quoted in the previous parts of this paper appear to be relevant in our case as well.

Also, those pilot-trainings pointed out that the system is extremely well accepted from the younger generation of civil servants (40 years old and lower). This category of civil servants generally have a positive attitude for IT and without any major problems use computers in their day to day work.

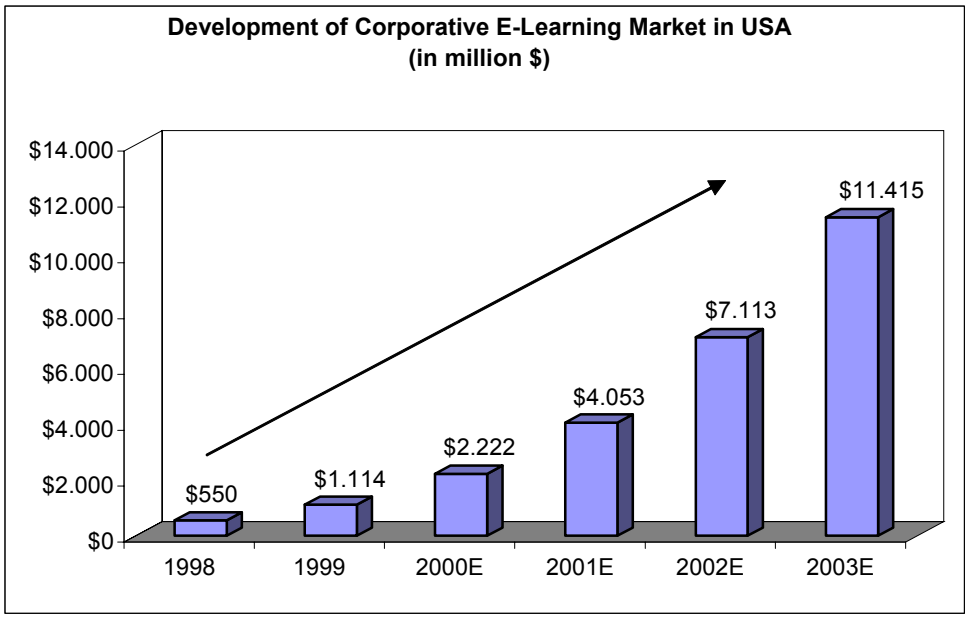
Main arguments for accepting this system by our colleagues are:

- Easy understanding of the essence of the material;
- No need for traveling to the training center in previously determined time;
- Adaptation of the learning process according their possibilities and capacities;
- Using of "empty steps" in the learning process.

We expect above mentioned civil servants to be a main promoters of the long-distance learning system for training of other civil servants. We consider that we have almost all preconditions for day to day use of the system. Of course, there is still work to be done on development of new contents, which will be demand driven process entirely depending on civil servants' needs.

[13] Civil Servants Low

Graphic 1: Development of Corporative E-Learning Market in USA (in million $)



Graphic 2: Internet Domination within Education Based on Technology

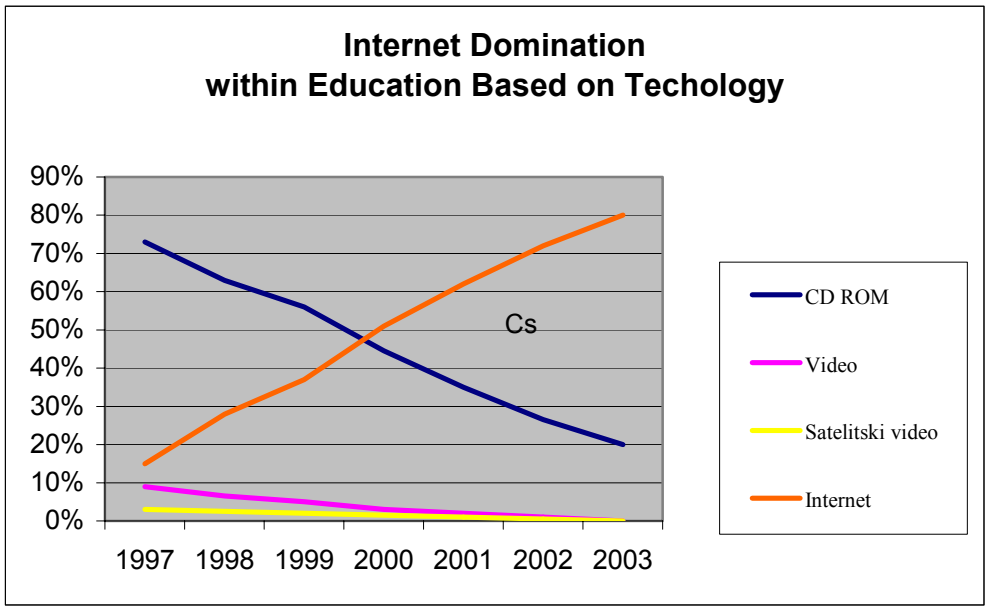
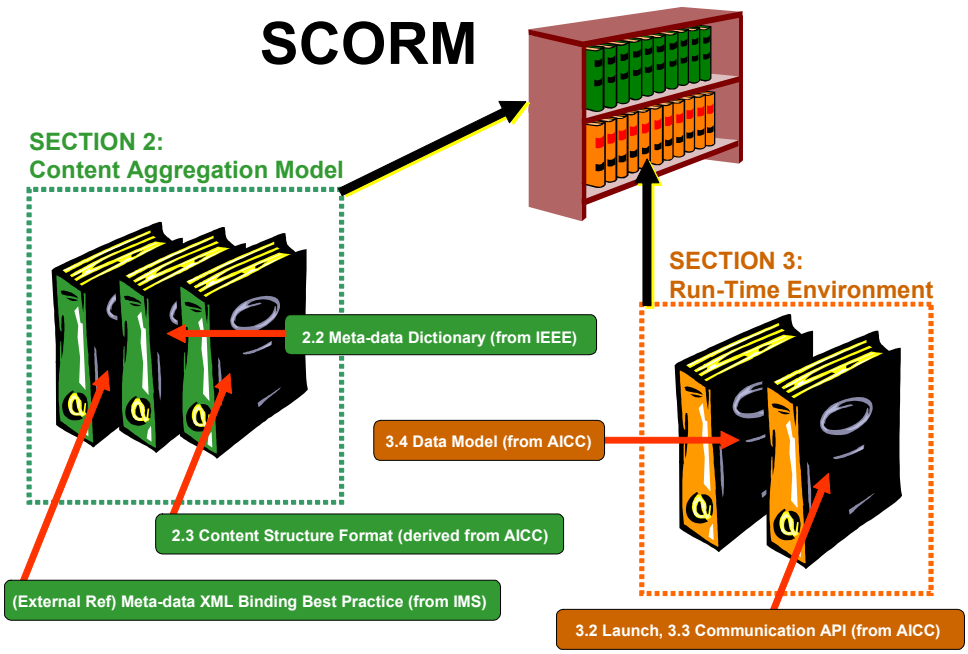


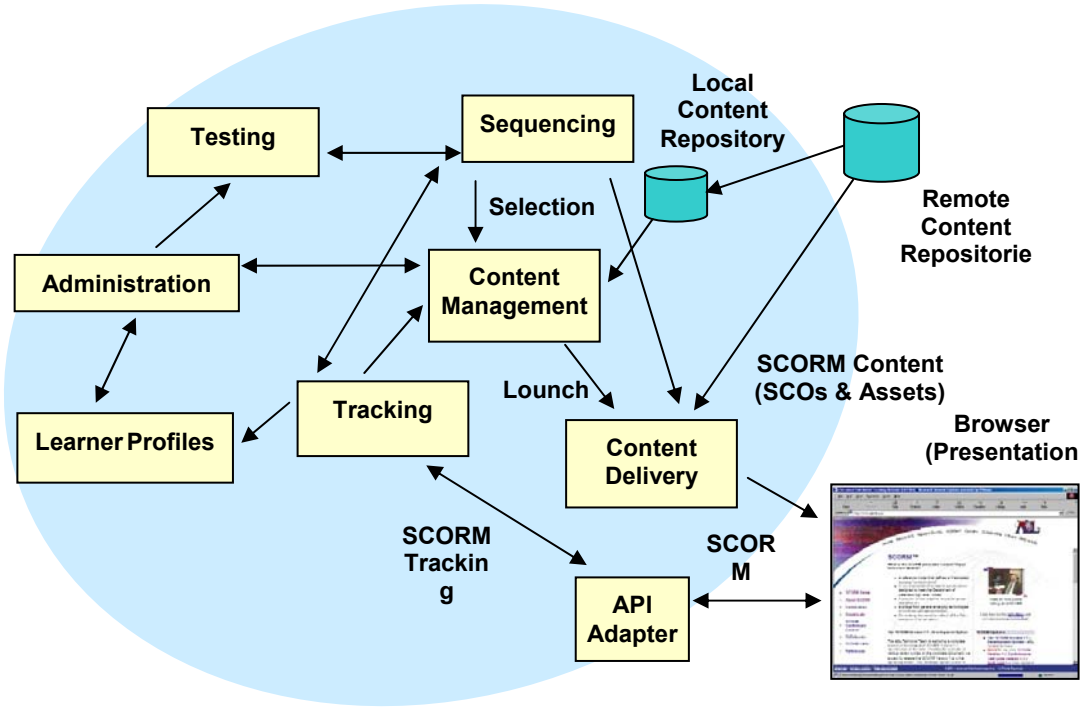
Table 1: Implementation Areas of E-learning Model

Areas	Percent of interviewed %
Management	45
IT	40
Personal Development	35
Selling	35
Operative and technical skills	30
Leading projects	25
Introducing with the product	25
Health and Security training	20
Training for services of users	15
Finances	15
Academic education	10
Law and legislation	10
Team working	10
Inter human relations	5

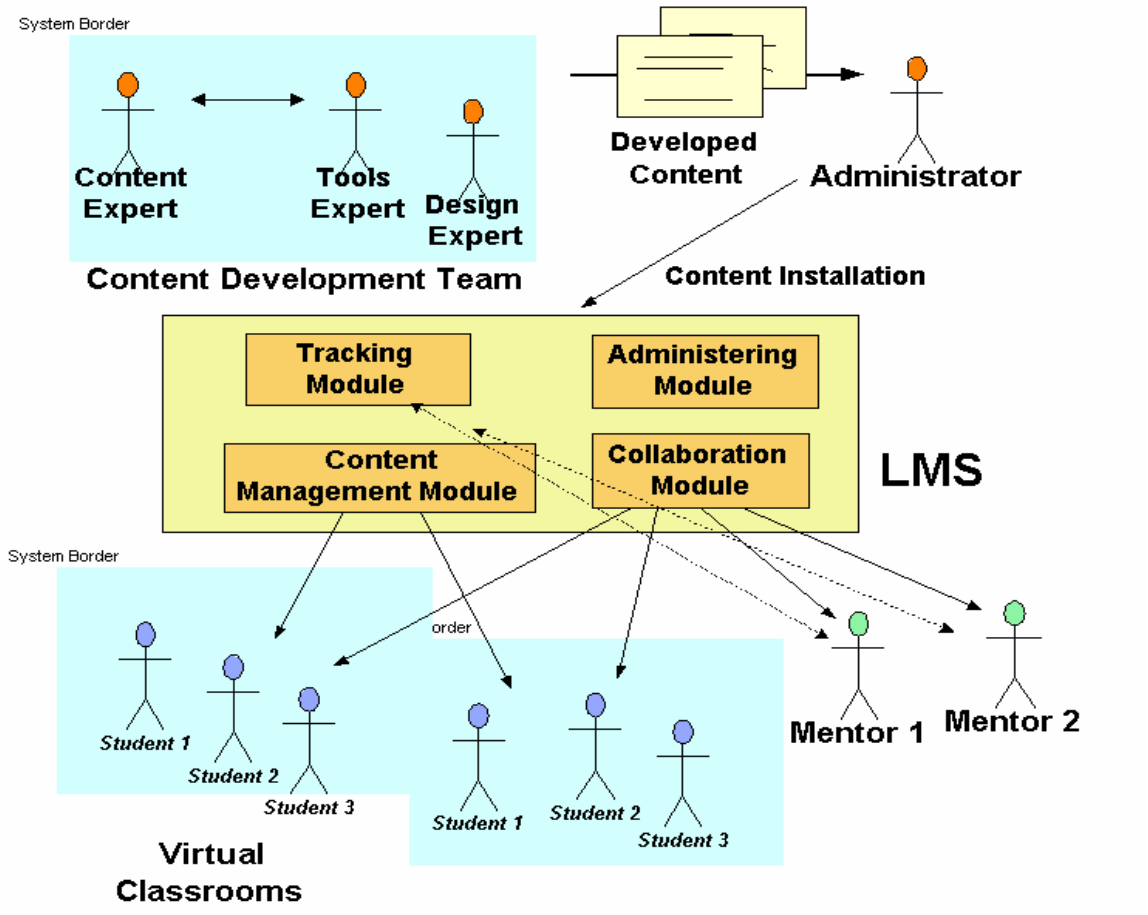
Graphic 3: SCORM Architecture



Graphic 4: LMS Functions



Graphic 5: E-Learning System Conceptual Framework



Graphic 6: SCO Future Role