
NATURAL SCIENCES & TECHNOLOGY

Building Information Technology Infrastructure for a Creative College

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Abstract: In this report, we present some basic content needs of information technology infrastructure in the direction of a creative college, including improving technical facilities of the network infrastructure, strengthening infrastructure network engineering, bandwidth expansion, development of software systems, opening studio workshops, factory electronic materials, building shared resources such as e-learning system, the sources materials for research, laboratory systems and building shared integrated data center unification.

1. Introduction

In the development of a creative college, there is a crucial need for building information technology infrastructure as well as advanced communication measures. In this report, we present some basic requirements of information technology infrastructure in order to fulfil this goal, including improving technical facilities of the network infrastructure, strengthening infrastructure network engineering, bandwidth expansion, development of software systems, opening studio workshops, factory electronic materials, building shared resources such as e-learning system, the sources materials for research, laboratory systems and building shared integrated data center unification. We also propose a multiple-phase project of constructing IT infrastructure, which aims to

suit the investment capability as well as the improvement of up-to-date technology.

2. E-Learning architecture

- System Administrator: responsible for entitle system performance, granting user access privilege and changing User interface (UI).
- Content Administrator: responsible for main system content, as well as composing lecture material and system resources.
- Teacher: responsible for a particular class, lecturing in class, organizing assessment, exchanging students and monitoring class.
- Trainee: registers for a class and approved by Admission. Trainees are allowed to study, take an exam and communicate/ socialize with teachers and peers.

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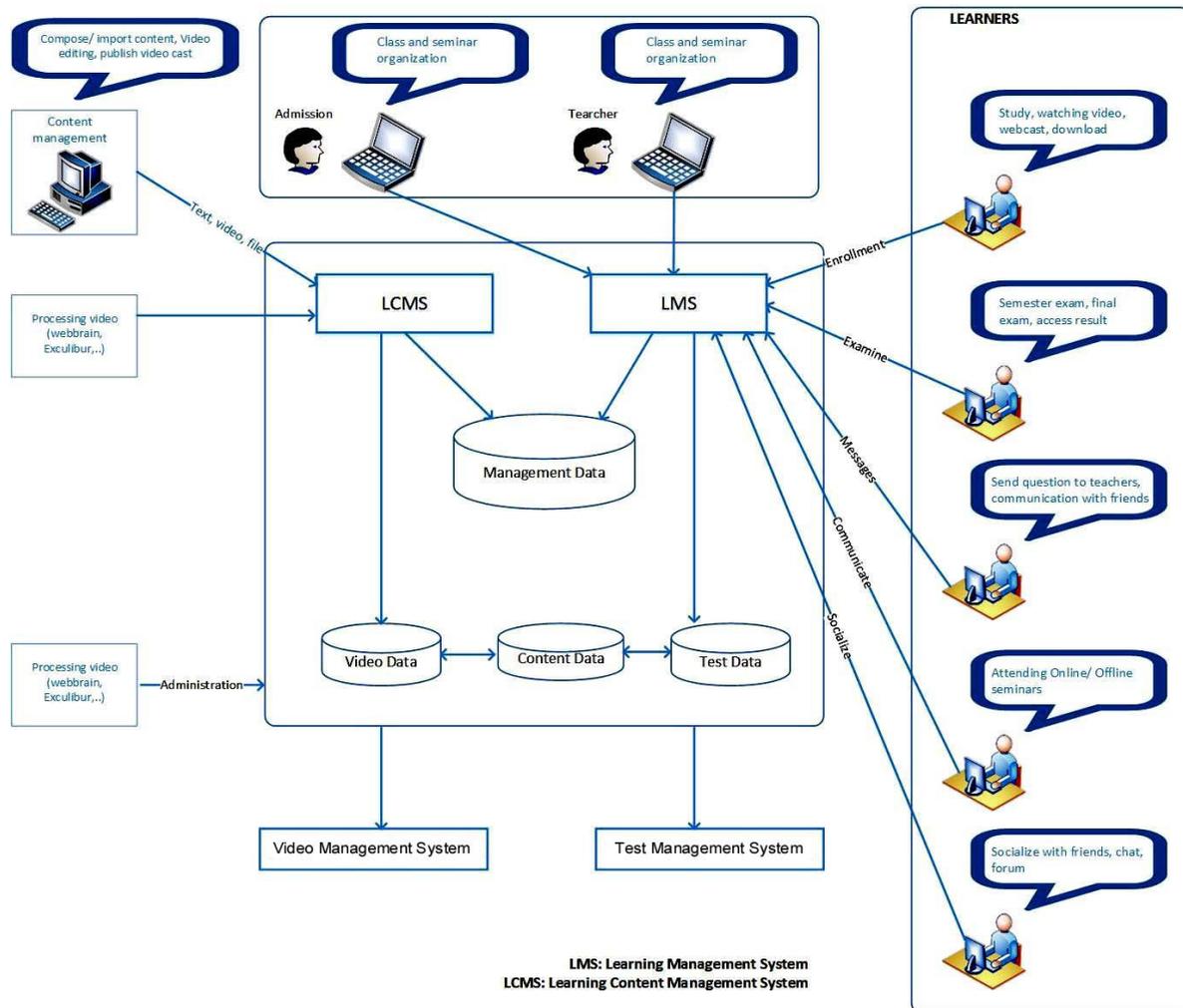


Figure-1. E-learning architecture.

3. Information technology infrastructure

- Objective: To develop IT infrastructure in order to meet following criteria:

- + Teaching and learning creatively
- + Smart administration system
- + Organizing creative support activities

- Implementation: there shall be 03 phases within this project

- + Phase 1: develop an independent e-learning system.

+ Phase 2: integrate local networks, e-learning network and laboratory system network.

+ Phase 3: enhance participant networks, complete IT infrastructure

3.1. Phase 1

- Objectives:

- + To develop a network for online, e-learning-based education, which can support maximum 2000 concurrent connections.

+ To provide facilities for number of subjects: content management, admission, teachers and students.

- Model of developing online education network

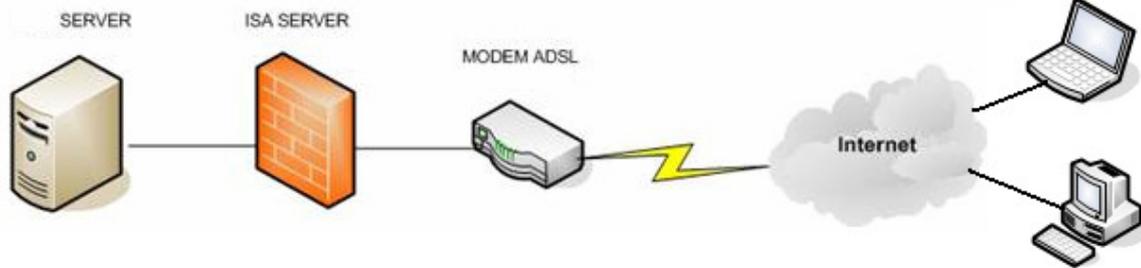


Figure-2. Model of e-learning network.

- The system consists of:
 - + E-learning Server: deploy resources and services.
 - + ISA Server: secure the system.
 - + MODEM ADSL: connect to internet.
- Hardware requirements:
 - + Fiber cable Internet connection, speed of 148Mbps and a domain name.
 - + E-Learning Server.
 - + ISA Server.
- Software requirement:
 - + Microsoft® Windows Server® 2008 R2 and 2008, Red Hat Enterprise Linux®, Debian 6, ISA 2008.
 - + MS SQL, MySQL, Oracle, PHP, CMS
 - + MOODLE (Modular Object-Oriented Dynamic Learning Environment)
 - + SCORM (Sharable Content Object Reference Model).
 - + MathML, Trivantis Lectora
 - + eLearning XHTML editor (eXe)
 - + Rich Media, Camtasia

- + Whiteboard Movies (WBM)
- + Adobe: Captivate, eLearning Suite, Presenter

3.2. Phase 2

- Objectives:
 - + To access e-learning system via laboratory and local network, increase number of concurrent connections to 20000 and reduce the load on Internet connection.
 - + To provide facilities for teaching, learning, monitoring and socializing creatively every time/ everywhere.
- Model of inter-connect networks:
 - + Network of Networks: local networks, including Servers/ clients that manage education system (number of concurrent connection above 500) and wireless system covered the entitle school.

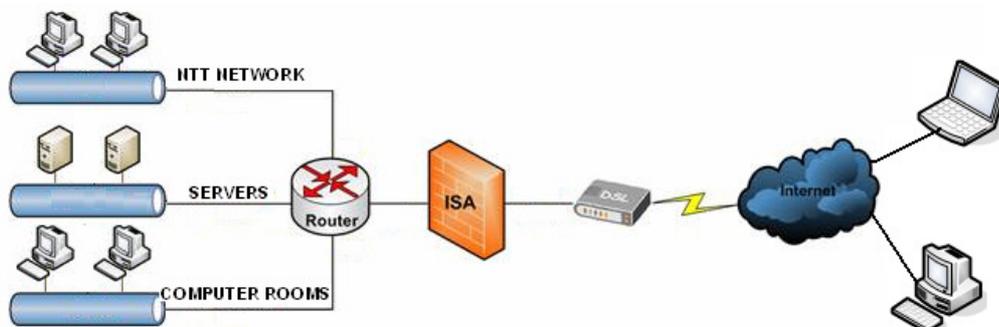


Figure-3. Model of inter-connect networks.

- + Network of Computer Rooms: network of computer rooms, laboratories, stimulators (over 1000 computer).

- + E-Learning network: existing e-learning network has been deployed in the first phase of this project.

- Hardware requirements: During this stage, apart from existing equipment's, it is necessary to add an extra Router to serve inter-connect networks.

3.3. Phase 3

- Objectives:

- + To set up complete information technology infrastructure to meet the requirements of a creative college.

- + To enhance and upgrade existing network infrastructure.

- + To develop fiber-cable networks under school management network.

- + To develop server cluster in grid and cloud computing.

- + To develop wireless network covers the entire school.

- + To integrate school system into main system.

- Hardware requirement:

- + To increase number of servers for e-learning system.

- + To add required wireless equipment's.

- + To build fiber cable network.

- + To enhance Internet connection speed to 1Gbps.

- + To improve privacy and security control.

- To complete existing services and connect to other education institutions

4. Conclusion

In order to meet such high-level goals of a creative college: teaching and doing research creatively, having a smart management system, as well as pro-active social activities, it is necessary to develop a smart and intelligent information technology infrastructure. In this report, we have proposed a reasonable approach to achieve this goal, by implementing three-phase project which aims to suit the college's investment capability, and takes up-to-date advanced technology into account.

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