

**CONCEPTUAL DESIGN OF AN INFORMATION AND  
COMMUNICATION TECHNOLOGY BASED (ICT-BASED)  
MANAGEMENT SYSTEM FOR UNIVERSITAS TERBUKA**

**By**

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**UNIVERSITAS TERBUKA**

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## EXECUTIVE SUMMARY

### Background

Universitas Terbuka (UT) is a nationwide institution offering distance learning opportunities to all Indonesians. The organization, although it has regional offices (ROs) throughout the country, is highly controlled and managed by the Head Office (HO) located in Jakarta. For its operation, UT collaborates with other institutions especially for its distribution of registration packages, course delivery, and conduct practicum and examination. Communication both within the HO and between the HO and the ROs relies mostly on conventional mode such as mail and face-to-face.

UT's learning materials are mainly print-based with some audio-video and computer-based materials. The use of computer networking including the Internet is still limited. The extensive use of computing is mostly for data processing such as for maintaining student records (the Computing Center) and scoring examination results (the Examination Center). Even though all unit in the HO are connected to UT's Local Area Network (LAN), the HO has not yet electronically connected to the ROs. Only a few ROs are already equipped with facilities to access the Internet . All services and materials that are provided and distributed through the Internet, such as academic journals (published by UT's Research Center at <http://psi.ut.ac.id/journal>), abstract of research findings (<http://psi.ut.ac.id>), supplementary learning materials (for about 150 courses out of about 700 offered courses), tutorials (for about 50 courses), and past examination results (one semester behind) are developed and managed by academic staff at the HO.

Management of daily activities is mostly centralized at the HO in Jakarta. Except for organizing face-to-face tutorials, the ROs do not have any authorization or equipment to plan and conduct other academic activities. This has created a lot of problems, which are mostly related to registration, learning support, and examination issues. The discussion of the situational analysis suggests that UT's problems are by and large due to:

- the lack of a fast reliable two-way communication channel/system between the HO and the ROs;
- the lack of a comprehensive data management system accessible to all staff in both the HO and the ROs; and
- the unbalanced division of authorities and responsibilities between the HO and the ROs.

Consequently, this rather centralized operational management system has resulted in inefficient and inaccurate decisions and operational actions.

## **Research Objective**

In accordance with the above background, the research was focused on studying distance education management models, especially those of institutions that cover large areas and employ decentralization and automation system in their operational management. The expected outcome of the research is to develop a conceptual model of a new management system for UT. The research was designed as an exploratory study based on literature and direct observations. The observations were conducted in the Florida Community College Distance Learning Consortium (FCCDLC), which is a statewide institution coordinating 28 community colleges. The selection of FCCDLC for the observation site was intended to obtain a comparison of management system between UT as a single mode open university (which is highly centralized) and a distance learning consortium (which by design is highly decentralized). This comparison will provide a clear and balanced picture of centralized/decentralized management systems.

## **Proposed Design of an ICT-Based Management Operational System**

The examples of the consortium model of management system show that a balance of centralized and decentralized systems for managing distance learning programs is effective and efficient. The examples and literature also show that ICT plays an important role in this kind of management system.

The proposed ICT-based management system is envisioned to be a mix of centralized and decentralized systems of registration, course development and delivery, learning support services, and examination using ICT. That is, ICT will be utilized not to completely replace but rather to automate some of UT's operational processes in conjunction with the current conventional procedures. This proposed system is expected to enhance UT's responsiveness to student's demands at local areas through ROs, and at the same time to achieve the common goals of the whole institution.

The mix of centralized and decentralized management system would integrate the new automated (ICT-based) management processes and procedures with the current manual system. This would not really change the organizational structure of UT. The difference would be in the existence of a centralized and comprehensive information system database that is accessible to administrators and academic staff in both the HO and ROs (see Figure 1). Therefore, despite the different locations of the HO and the ROs, administrators and academic staff would access and use the same data and information. Access to the same information system database would empower administrators and academic staff at the ROs. It would then enable the authorized staff to make decision making and take actions, without depending on the HO's staff like in the current management system. The ability to make well-informed decisions and to take immediate action would enhance the system's responsiveness to students' demands. This will also expect to increase the ability and confidence of ROs'

administrators and academic staff, and ultimately to enhance their sense of responsibility to providing excellent services for students. Finally, the shared responsibilities will expectedly result in a comprehensive manual and online services for students.

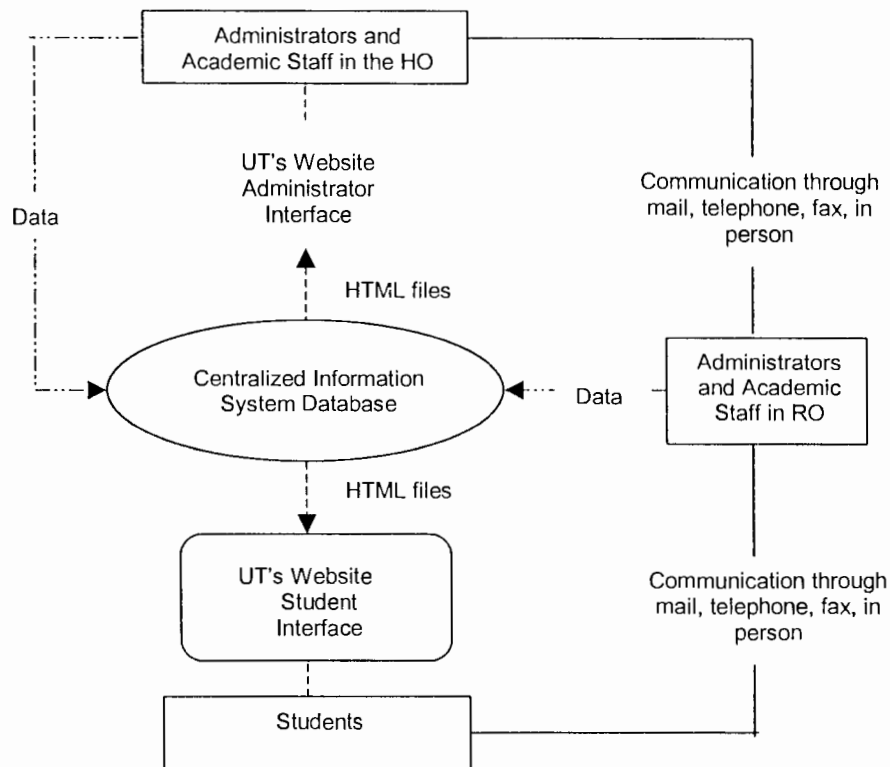


Figure 1. The Nature of Relationships and Communications between UT and the Students

The new ICT-based management system will enable UT to provide students with a comprehensive online service. Figure 2 specifically outlines the online services that can be made available by the ICT-based management system. As the figure shows, services of the ICT-based management system can be presented through one centralized portal (i.e. UT Web Site) with two interfaces: the student's interface and the administrator's interface.

### Preparation For Implementation

The new ICT-based management system proposed earlier is based on a vision that is derived from the institution's larger vision. A vision is the picture of what the institution is going to like when the proposed system is fully implemented. That picture is expected to enforce all stakeholders to contribute in their capacity for the achievement of the institutional goals; and especially for the implementation of the system that is designed to accelerate the

achievement of those goals. Accordingly, sharing the vision with everyone to be involved is the most important thing to do for implementing a new and innovative system.

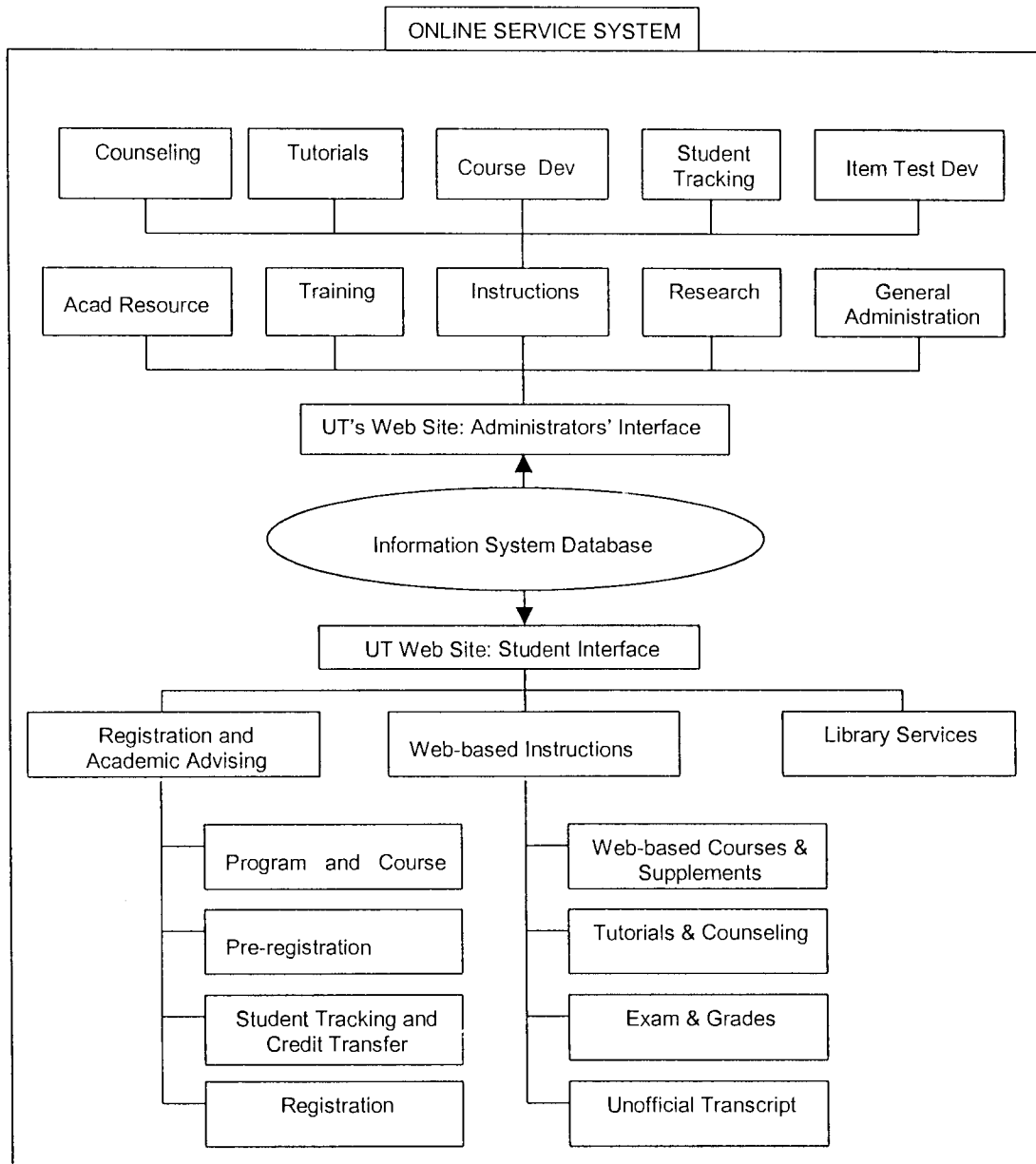


Figure 2. Outline of UT's Online Service

It is difficult to gain acceptance of a new way of doing things, especially if the people are not involved in formulating the vision. On the other hand, it is also extremely difficult to involve everybody in the process of developing a plan and much less in formulating a vision. Therefore, the best thing to do is to share the vision with key persons and to convince them about the benefit of the new system for UT's future.

Once the vision is shared and everyone agrees with the stated common goals, it is also imperative to involve those key persons in translating the vision and the conceptual design of the new system into a strategic plan as much as possible. Therefore, a strategic “technology” plan should be developed carefully in accordance with the current stage of art of the institution; and the development of such a plan should involve people from across units within the university.

As a guideline, the implementation of an ICT-based management system within UT's context should be conducted upon the completion of the following preparatory steps:

1. Assessment of the existing infrastructure

An ICT-based management system incorporates a highly integrated use of various technologies and requires several elements of infrastructure, i.e. physical, human support, and funding (Bates, 1998). Although physical infrastructure is very important, it has to be linked and be simultaneously developed with the two other elements.

2. Development and upgrade the required infrastructure

Upon the completion of the assessment, UT should have a clear idea about what needs to be done regarding the whole infrastructure. It is not surprising that the list will be long and will be extremely overwhelming. At this stage, the most frequently asked question is “where to start”, especially under the tight budget circumstances. The planners and the top administrators need to comprehensively analyze the importance of each subsystem based on its contribution to the implementation of the whole system. Which subsystem and or technical feature should be developed and implemented first based on the point of necessity and the feasibility of the required budget. The prioritizing process should be aimed at achieving a seamless transition from the current system into the new envisioned system.

3. Development of manuals and materials

Manuals and all materials need to be developed prior to implementation. This is very important for the seamless operation of the whole system. Manuals refers to technical guidelines for both administrators and students about how to work and study within the new operational system. Manuals for administrators should include how to administer both the online and the off-line services. Manuals for students should as well elaborate how students can access and use both the online and off-line services. Most importantly, the manuals should tell the users “where to go” or “who should be contacted” in case of problems.

4. pilot project the plan in a small scale basis

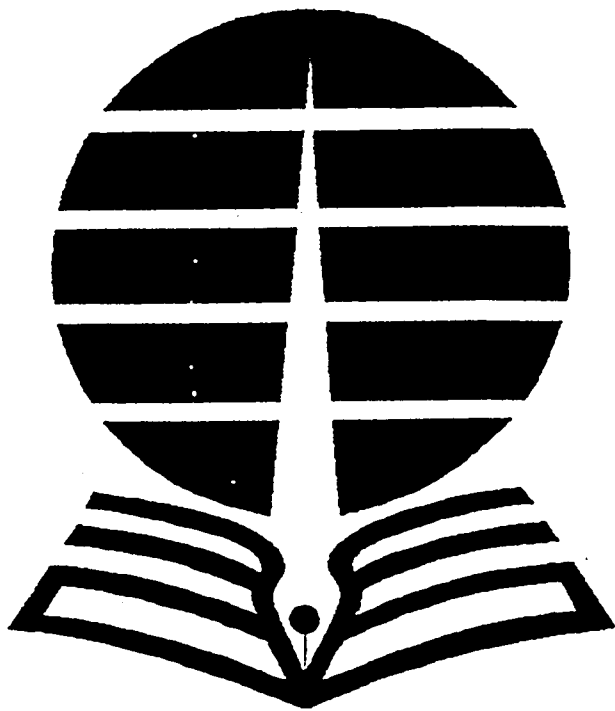
There are at least two approaches to pilot project a new system. The first approach is to pilot project the whole system within a selected and limited area of coverage, and the

second approach is to pilot project a selected element of the system for the whole area of coverage. The first approach will enable UT to select the area which already has the necessary infrastructure and facilities to support the new system, but it may create non-technical problems such as inequality of services to students in other areas. In addition, as more advanced areas are usually located in Java, this will enhance the already existing Java and non-Java sentiments. The second approach will ensure equality of services for all students. However, since the pilot project only implements some parts of the new system, the inputs gathered will also be partial.

## **Conclusion**

The proposed management system is envisioned to be ICT-based and a mix of centralization and decentralization of mechanisms/procedures for registration, course development and delivery, learning support services, and examination. In other words, ICT will be utilized not to completely replace but rather to automate some of UT's operational processes in conjunction with the current conventional procedures. This proposed system is expected to enhance UT's responsiveness to student's demands at local areas through ROs, but at the same time to achieve the common goals of the whole institution.

As it is difficult to gain acceptance of a new way of doing things, especially if the people are not involved in formulating the vision, it is recommended that the implementation is started with sharing the vision with key persons within the institution. Several preparatory steps need to be done before UT fully implements the new proposed management system. This is important to ensure the seamless transition from the current operational processes to the new ones. The preparatory steps include the assessment of the existing infrastructure, the development and upgrade of the required infrastructure, the development of manuals and materials, and the conduct of a pilot project on a small scale basis.





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# INTRODUCTION

## Background to the Problem

As in other developing nations, the most important concerns in education in Indonesia have to do with two issues: quantity versus quality. Quantity of education refers to the coverage of educational provision: how much of the population has access to education? How many schools, colleges and universities are available? And for who? This concern for higher education has now been somewhat addressed by the establishment of the Open Learning University (Universitas Terbuka or UT) in 1984, which has been acknowledged and proven to have increased access to education. It is primarily for people who normally can not access or will not attend schooling due to barriers related to demographic, economic, or time factors. After 15 years, UT has been able to serve more than 400 thousand students each semester. This number of students, who are spread throughout the country, represents about 12% of the national participation rate in around 200 public and private higher education institutions.

The concern for quality, however, is not yet completely satisfied. Despite its success in increasing access to higher education for a wider population, the quality of UT is still questionable to some people. Can UT, which employs a distance education system of instruction, deliver the same quality of education as "good instructors" in the classroom? Can interactions between instructors and students be accommodated? Can it provide feedback to the students? Will the graduates hold the same quality as those graduated from conventional universities?

Those questions have also been somewhat substantiated by many problems that occurred during the sixteen years of UT's operation. Issues that are most often complained by students related to the management system of daily operation such as the lateness of course materials delivery (Nurmawati & Meilani, 1994), the lack of or limited learning support services (Tim Peneliti Puslitga, 1997), the lateness of examination result announcement (Tim Peneliti Puslitga, 1997), and the lateness of registration processing (Nurmawati & Meilani, 1994). These problems have resulted in low course completion, persistence, and graduation rates. The average individual completion rate was approximately 23% (Tim Pengembangan Model Tutorial, 1999). The average rate of student re-registering into their second semester without interruption was only 61%, and the degree completion rates of UT's regular students (excluding students of FKIP) was less than 15% (Belawati, 1998). This completion rate is lower than the average completion rate at the British Open University's degree programs of 48.8%, the Indira Gandhi National Open University's diploma programs of 22%, and Thailand's Sukhothai Thammathirat Open University's degree programs of 17%.

Observations and discussions about those problems lead to issues about centralization and decentralization. UT, which follows the management of the British Open University, is

managed by a strong management team in the Head Office that is located in the capital city of Indonesia, Jakarta. The 31 regional offices, which are spread throughout the country and which are established to provide local services at regional (mostly provincial) level, can not provide the same level of support. Regional Offices have expressed their concern about not having the capability to immediately respond to local problems as expected by students. This is partly due to the lack of authority and clear guidance from the Head Office as well as to the lack of capable staff and working facilities.

Although decentralizing the current management system seems to be the logical answer to the problems, it is imperative to first thoroughly evaluate the current management system and develop a conceptual model of a more balanced combination of centralized/decentralized management system. Any management that involves complex process needs standard procedures or systems for administrative convenience and for enforcing consistent overall service to all students. Therefore,

*“... the point is not to abolish the centralized systems, rules and procedures, but to ensure that every rule and procedure has an important purpose, that the rationale for each is well and widely understood, and that there are clear and simple mechanisms for exceptions and appeals.” (Paul, 1990, p. 117)*

Furthermore, with the development of information and communication technology (ICT) as well as the availability of its physical infrastructure in Indonesia, it is now possible to establish a more automated management system.

The recent development of ICT has also opened a possibility for UT to establish a fast, reliable, and affordable two-way communication channel not only with the Regional Offices but also with students. In Indonesia, there are nearly 2,500 Telecommunication Kiosks (known as WARNET) that provide Internet access at reasonable rates to the general public, including UT students. The distribution of these WARNET is widely spread throughout the country, especially in most populated islands such as in Sumatera, Java, and Bali. The previous survey of the availability of WARNET within UT students' residences/work places reveals that 33% of the surveyed students are within 30 minutes travel time from the closest WARNET, and about 40% of the surveyed students said that they could access the Internet using their office facilities (Hardhono & Belawati, 1999). The competition among WARNETs has also reduced rental rates to the amount affordable to students (Hardhono & Belawati, 1999). These figures provide some picture about student accessibility to the Internet.

### **Research Objectives**

In accordance with the above background, the research was focused on studying distance education management models, especially those of institutions that cover large areas and employ decentralization and automation system in their operational management. The

expected outcome of the research is to develop a conceptual model of a new management system for UT.

## **Methodology**

The research was designed as an exploratory study based on the literature and direct observation of the Florida Community College Distance Learning Consortium (FCCDLC), a statewide organization coordinating 28 community colleges. The selection of FCCDLC for the observation site was intended to obtain a comparison of management system between UT as a single mode open university (which is highly centralized) and a distance learning consortium (which by design is highly decentralized). This comparison will provide a clear and balanced picture of centralized/decentralized management systems.

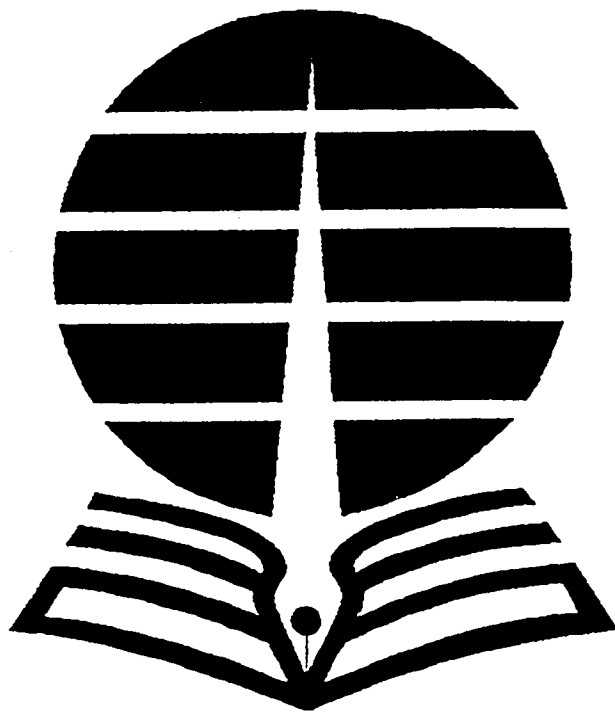
Literatures reviewed included published and unpublished documents (restricted databases, meeting papers, and reports circulated within the FCCDLC and its 28 community colleges), journal articles, textbooks, as well as websites of various institutions offering distance learning programs. Discussions and informal interviews were also conducted with key resource persons including the Executive Director of FCCDLC (Dr. John H. Opper, Jr.), the Associate Executive Director of FCCDLC (Ms. Susie Henderson), the Deputy Director of Florida State Board of Community Colleges (Dr. Tom Furlong), the Vice President for Academic Services of Tallahassee Community College (Ms. Barbara Sloan), the Assistant Of the Florida State University Office for Open and Distributed Learning (Ms. Carol Hayes), the Deputy Director for Student Support Services of the Florida Community College System (Ms. Connie Graunke), and representatives of the community colleges to the FCCDLC.

## **Organization of the Report**

This report is divided into four parts. The first part is the introductory description of the background, the objectives, and the methodology of the research project. The second part focuses on the discussion about UT's current operational management system, which is intended to give a clear picture about the current situation and the pertinent problems encountered by the university. This should give the reader a background of management issues that need to be addressed, which is elaborated in the next part. The third part elaborates the conceptual design of the ICT-based operational management system that is proposed to address the pertinent issues discussed earlier. The report closes by discussing four necessary preparation steps for the implementation of the proposed management system.

The results of the observation, interviews, and literature as well as document reviews within the FCCDLC system are synthesized in a separate report, and presented as an appendix to this report (Appendix 1). However, the findings are brought into the discussion across the parts as the relevant issues arise. This is meant to maintain the flow of thought towards the

development of a conceptual design for "an ICT-based operational management system" for UT.



## THE INDONESIAN DISTANCE LEARNING UNIVERSITY

### The Missions

The Indonesian Open Learning University or Universitas Terbuka (UT) is a state university and the only university in Indonesia that is entirely using distance education as the mode of teaching. It was established in 1984 with three main missions: (1) to widen access to higher education, especially for recent graduates of senior high schools, (2) to train increasing numbers of students in areas demanded by the economic and cultural development of the country, and (3) to upgrade primary and secondary school teachers who graduated from the short-term programs to enable them to obtain the full-teacher training degree. UT was intended to be a flexible and inexpensive university focusing on serving people who do not have the opportunity to attend conventional face-to-face higher education institutions for various reasons, including lack of funding, living in isolated and rural areas, and working full-time.



Figure 1. The Location of UT's Regional Offices Throughout Indonesia

### Organizational System

UT is one of the mega universities in the world (Daniels, 1995) with a student body of over 300,000. The Head Office (HO) is located in the capital city of Jakarta and its 31 Regional Offices (ROs) are scattered throughout the country (see Figure 1). The university is headed by a Rector with four Vice Rectors (VR): VR I for academics affairs, VR II for general administration and finance, VR III for student affairs, and VR IV for operation and collaboration. The organizational structure of UT can be depicted as Figure 2.



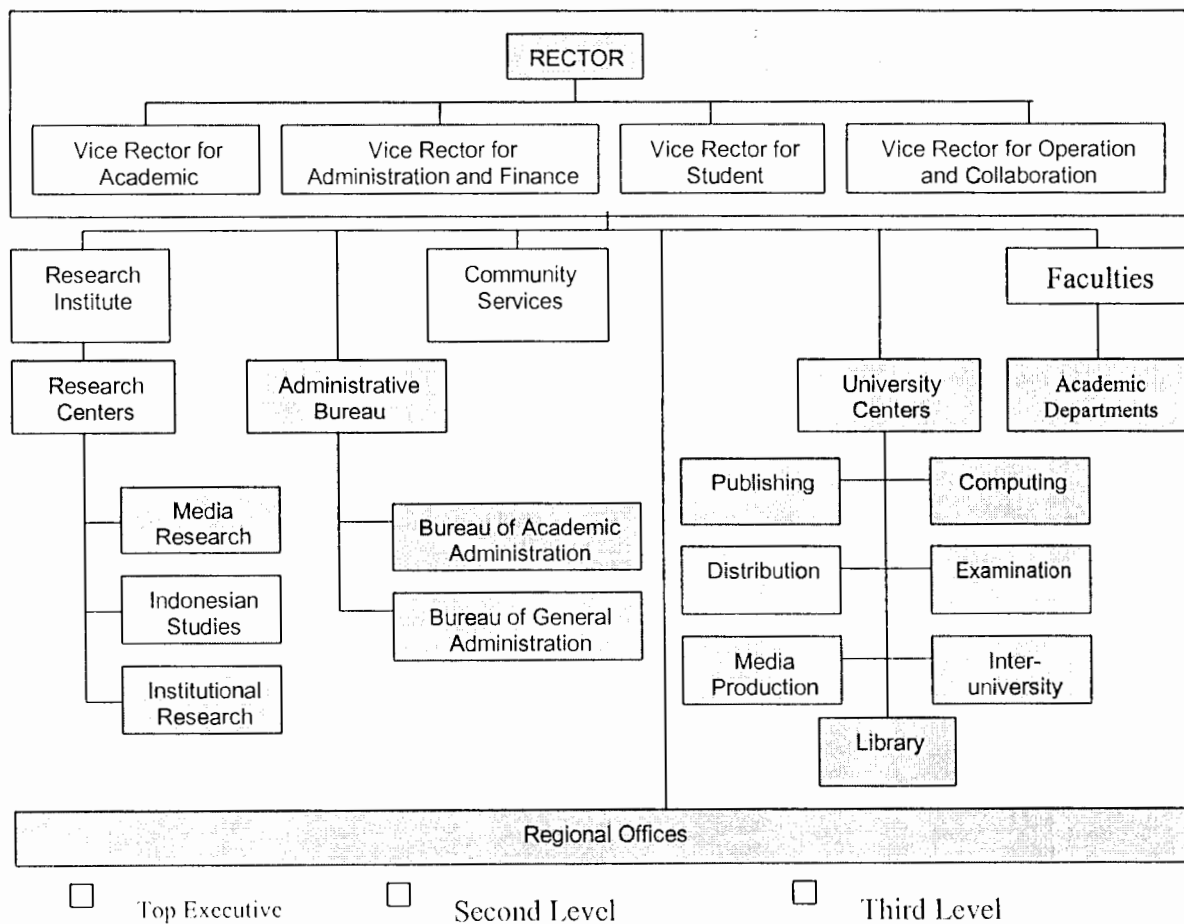


Figure 2. Organizational Structure of Universitas Terbuka

UT's management system is highly centralized. Institutional policies regarding both administrative and academic matters are determined by administrators in the HO. Activities and operations related to the development and production of course materials, development of test/examination items, and examination data processing are centrally managed from the HO in Jakarta. The ROs, among other things, are technically responsible for carrying out the daily operational activities in local areas. Those activities are mainly receiving student registration, organizing face-to-face tutorials, some administrative counseling, and organizing examinations. Within the organizational structure, the ROs are ranked as and headed by third level executives. This indicates that the ROs do not have too much authority and in fact, they mostly perform only administrative and clerical works.

As shown by Figure 1, the ROs are scattered throughout the country. Although the offices are located in relatively big cities within the local area, it does not mean that they have the appropriate infrastructure for accessing electronic (read: computer mediated) communication means. Communication between the ROs and the HO relies mostly on mail and courier services. Telephone is widely used but limited only for short emergency "trouble shooting"

purposes due to its high cost. Only about six ROs have connection to the Internet, and only three ROs have human resources to optimally use it. **This lack of fast two-way communication channel has hindered the efficiency and the effectiveness of data and information trafficking between the ROs and the HO.** This has caused some confusion and inconsistencies of data that led to delayed and ineffective decision making and student-related services.

Within the HO in Jakarta, programs and activities are equally decentralized to respective departments. Each unit is to plan its program and propose its respective budget annually. The program and budget plans for all the units are reviewed at institutional level for approval. Academic programs and activities such as curriculum development, course materials development, and test item development are the responsibilities of the Faculties with their respective academic departments. The Deans are the top decision makers for academic matters and report to the Vice Rector for Academic Affairs. The "operational matters" such as maintenance of student records, examination preparation (e.g. duplicating examination sets), and course materials distribution are decentralized to respective centers, which the Heads report to both the Vice Rector for Academic Affairs and the Vice Rector for Operational and Collaboration Affairs. Administrative matters such as finance, employment and human resource development, as well as general administration are the responsibilities of Bureaus and units under the Vice Rector for Administration and Finance. Meanwhile, student related programs and activities are planned and conducted by the Vice Rector for Student Affairs involving both academic and administrative staff across units and academic departments/faculties, as well as the ROs.

Although there is an internal computer networking (LAN) available, UT does not have a comprehensive database which incorporates both the administrative and academic data and information. The current UT database stores only administrative academic data such as student records. Information and data regarding finance, employment, and research for example, are not yet stored and administered in a database-like system. **This piecemeal computing system within UT's internal management has caused inconsistency of data that, as with the ROs' case, has often led to inefficient and ineffective operational processes and policies.**

Collaboration with external institutions is also an important part of UT's organization. UT has established long term collaborations with several institutions such as with the National Postal Service (PT Pos Indonesia) for distributing registration forms and delivering course materials, with the state-owned bank of Bank Rakyat Indonesia (BRI) for accepting student tuition fees, and with the Provincial Governments for lending their school buildings for conducting examinations. With the large area of coverage, it is impossible for UT to carry out its missions without collaborating with other institutions, which already have the necessary supporting

infrastructure. It is this networking system that has enabled UT to reach and provide educational services to almost all inhabited islands of Indonesia.

### Registration System

UT's registration is open all year long, so that students could sign up any time according to their convenience. Students can buy a registration package (containing course registration form and tuition fee form) from post offices in their local areas. Once they completed the forms and know how many courses to take, they have to transfer the tuition payment to UT's account. The completed registration form and a proof of payment are then to be submitted to the nearest UT's regional offices (by mail or in person). Registrations received by ROs will be processed locally and the data will be sent to the Computing Center in the HO in Jakarta in digital format through floppy disks (except for three ROs that have Internet connection). The procedure of registration can be depicted in Figure 3.

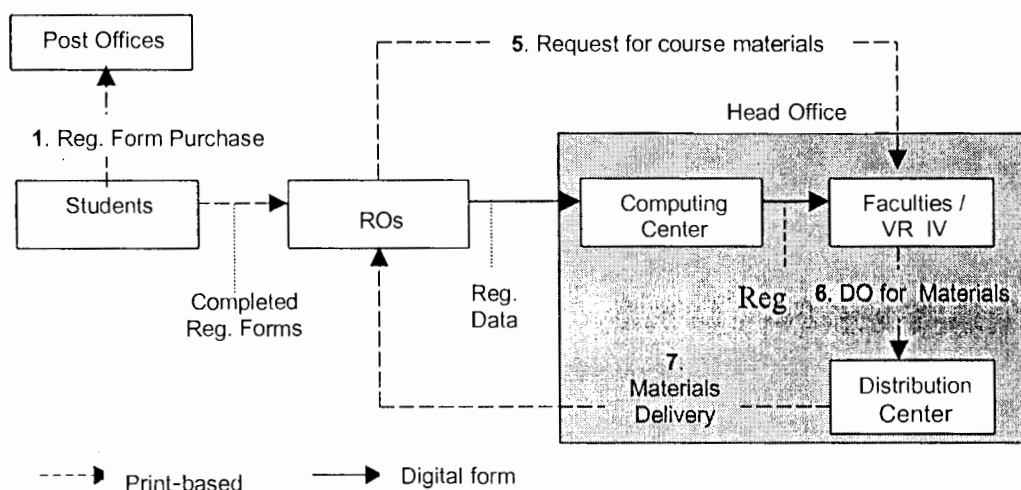


Figure 3. Registration Procedure

As shown by Figure 3, students submitted the completed registration forms to ROs and are processed locally at the ROs. Since data are not automatically and electronically sent to the HO, registration data will usually sit for one to two weeks at the ROs before they form a batch and are mailed to the HO. The often late arrival of those registration data has an impact on the punctuality of the course materials delivery. This is because the Center of Distribution (at the HO) will only dispatch course materials after they receive a "delivery order" from the Faculty or the Vice Rector for Operation, which is done after they have the number of students registering for each course from the registrar (through the Computing Center) and or request from the ROs. This long procedure has often resulted in late delivery of course materials. As often complained by the students, the materials sometimes arrive at the

Regional Office too close to the examination time. **These problems clearly suggest that UT needs to establish a communication means with the ROs which would facilitate electronic and automatic data transfer, or even electronic course materials delivery.**

### **Course Development and Delivery**

Printed materials are the main medium for instructional delivery. The courses are developed by course teams, that at least consist of a subject matter specialist and an instructional designer. Each course, depending on its credit unit, would be presented in several modules. The modules are designed to be self-instructional so that they will be able to be used by students with minimum assistance from the tutors/mentors. The subject matter specialists are usually invited and hired from nationally recognized conventional universities. The standard mechanism is following the writer-editor pattern of course development. That is the subject matter specialist independently writes the manuscript and UT's instructional designer formats the content in accordance with UT's standard. The instructional designers are also responsible to ensure that each course would be broken down into several modules (each module represent 3 credit units), and each module would consist of general and specific instructional objectives, introductory parts, the body of the content, exercises, summary, and formative tests. Moreover, since printed materials are the most accessible medium to most UT students, it is mandatory that the modules contain 100% of the course content stated in the course syllabi.

This current system of course development is very timely. The subject matter specialists who work independently at their own places do not usually involve the instructional designers until the courses are completely written. The instructional designers who also act as course managers do not have any control on the speed of writing, except by the means of reminder letters or calls. After the courses are completed (which usually takes much longer time than what initially agreed upon), the instructional designer would then correct and transform the materials into UT's format. If there are some missing parts of the materials, the instructional designers would go back to the subject matter specialists and ask them to make some revisions. This "back and forth" process can take up to one year. **Altogether, the course development process can take as long as two years.** With the availability of desktop publishing technology and the Internet, it is actually possible for UT to enhance the speed of this process by making the course team work in a virtual environment. That way, both the subject matter specialists and the course designers can work hand in hand throughout the process, and thus speed up the whole process.

Once the master copy of course materials is developed, the print-based materials (known as modules) will be duplicated by the Publishing Center and stored in the Distribution Center's warehouse. The modules are distributed to students through the ROs. Since purchasing the course materials is voluntary (students may borrow from other students), modules are sold

by UT through the ROs and few commercial stores. The Distribution Center will stock the printed course materials at the ROs based on the number of students taking the courses at the time. As previously stated, this is why the registration data are important for the availability of course materials at ROs.

Beside print-materials, UT also develops non-printed materials for supplementary as well as enrichment materials. At its initial stage, UT mostly developed audio and television programs, which were broadcasted through the national public television (TVRI) and radio (RRI) stations. However, with the enhancement of computer use in Indonesia, starting in 1998, UT has also been developing computer-based materials such as Computer Assisted Instructions (CAI) and web based materials (termed as Internet-based Supplement) distributed through the Internet. However, the development of those computer-based materials is still limited and conducted as a project managed by the Center for Media Research and Development.

The development and production mechanism for non-printed materials are centralized and treated as a project-based system and managed by two Centers. The Center for Multimedia Production is responsible for developing mainly audio and video programs. This Center has the hardware (audio and video studio) and human resources (media specialists) to help academic staff develop audio and video programs for their courses. The courses are selected by the academic departments and the academic staff would act as the content specialists. The media specialists would assist them in writing the scripts and producing the programs. The Multimedia Production Center is also responsible for duplicating and transmitting the audio and video programs. The development of computer-based materials (CAI and Internet-based) are coordinated by the Media Research and Development Center (MRDC), which historically was established to enhance the utilization of ICT at UT. As the Multimedia Production Center, the MRDC is also equipped with the necessary hardware, software, and human resources (e.g. graphic designers, web designers, etc.). This Center is responsible for training academic staff and assisting them in developing supplementary computer-based learning materials. Further, the Center is also responsible for managing UT website that distributes these supplementary learning materials through the Internet.

These centralized systems for developing the non-printed materials have been considered effective in resource sharing. Nevertheless, it is also felt that the current number of working stations (PCs) and the existing UT's bandwidth for Internet connection need to be increased significantly. Currently, the number of working stations connected to the Internet is only about 80, and only about 27 of them are installed in the Academic Departments to be used by about 250 academic staff.

### **Learning Support Services**

Universitas Terbuka, which was started with 65 thousand students who registered for about six Study Programs, was able to provide two free tutorial services for each course offered

within a semester. However, evaluation studies (see Belawati, 1996) showed that those free tutorials were poorly attended due to various reasons. One of the most frequently mentioned reasons by students was that the locations of tutorials, which were usually held in the capital city of the province, were considered too far from where the students live. Some students claimed that they had to travel for at least a day to be able to attend tutorials. This has made tutorial provision inefficient, and thus UT decided to terminate the provision. Tutorials were then only provided when they were requested by at least 20 students. Evaluation studies again showed that only a small number of students ever requested tutorials.

At the same time, however, students who live in relatively urban areas and have access to a good tutor tended to set up study groups and invited tutors on their own. Those study groups usually hired their own tutors and set up regular study times at their convenience. This phenomenon seemed to work very well so that UT started to encourage all students to set up study groups for their own benefit. Along with the encouragement, UT's regional offices, which are located throughout Indonesia, organized an initial gathering for (especially) new students so that they could meet their peers and set up study group. UT also helped these study groups to find tutors when it is necessary. Data show that up to present, there is over 1000 study groups that have been established and are working well throughout the programs.

As the university grows, the student body also enlarged to over 400 thousand students (in 1997). Furthermore, UT's Study Programs has also increased to over 30 offering more than 700 courses per semester. With this large number of courses, UT definitely needs to look for alternative models to provide tutorials beside the face-to-face one. Therefore, based on the availability and accessibility of different kind of technologies suitable for different characteristics of UT's students (from those of having access to and the proficiency with higher technology such as computers and the Internet to those of not having access to and illiterate of computer), UT has now been employing a "supermarket" model of learning support services. As indicated by the term, the learning support services (i.e. tutorial services) are designed to employ various technologies from print (or even hand-writing) technology (correspondence) to computer technology. The models include correspondent tutorials, face-to-face tutorials, tutorials through radio, written tutorials through the Internet, and written tutorials through integration of Fax-Internet. Except for the face-to-face tutorials, which are organized and managed by ROs, all other models of tutorials are organized and managed by academic staff in the HO.

Nevertheless, as in course development, the provision for learning support at a distance (especially the Internet-based) relies heavily on infrastructure. **Therefore, if UT wants to enhance the effectiveness of its learning support system, it needs to improve the availability of workstations and its bandwidth for Internet connection.**

## Examination System

Examination for student learning assessment is carried out through one mid-term take home assignment and one final examination at the end of the semester. The mid-term assignment is sent to students as one package with the course materials. Students are expected to submit the completed assignments at a certain date (usually about one month before the final examination) to the nearest RO. The assignments are in the form of objective tests and are scored by the ROs' staff using the key answers sent from the faculties at the HO. The scores are then sent to the Examination Center in digital form through floppy disks. The mid-term assignment's score will be integrated to the final examination score and contribute about 15% to the final grade. The final examination is a sit-in examination and held twice a year, which are in June and December for DII Primary School Teacher Training Programs and May and November for other Study Programs. Students, as they may register at any time during the year, will automatically be assigned to take the examination to the closest date possible. Therefore, students who register too close to the examination time (about less than 6 weeks) may have to wait and take the examination in the next semester.

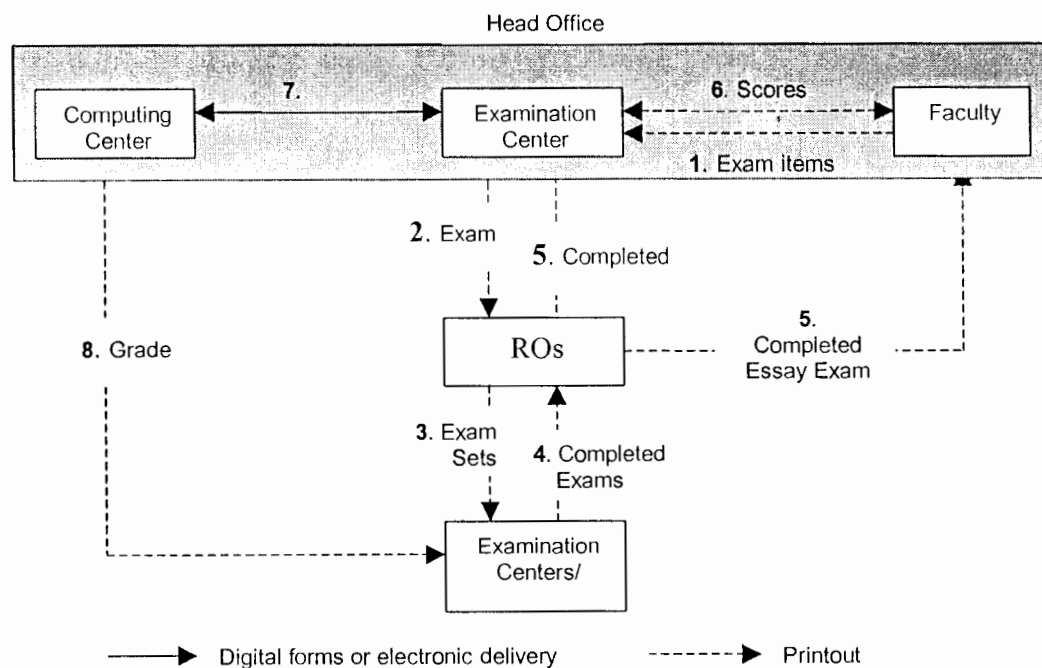


Figure 4. Examination and Grading Mechanism

For conducting the examinations, UT has established approximately 360 examination sites, which are usually located in local schools premises. Beside these two kinds of student assessment, some courses also require students to do practicum or micro-teaching (for

teachers) and write reports to be submitted and scored. For such courses with practical exercises, UT has established long term collaborations with relevant institutions nation-wide such as with the local universities, local schools, and other training centers. For example, for conducting and assessing practicum for the Agricultural Extension Study Program, UT collaborates with the Agricultural Extension Academy (in six locations) and the Husbandry Academy (in two locations) owned by the Ministry of Agriculture, which have the necessary facilities and human resources for supervisors.

Examination items are developed by content specialists (who can be either UT's academic staff/faculty or hired persons from other conventional universities) under the coordination of academic departments at the HO. The examination sets are prepared by the Examination Center and will be sent to ROs through UT's couriers and regular secured mail services. The examination sets are sealed in envelopes and will only be unsealed on the time of the examination in front of the students. The completed examinations will be packaged by ROs, sent back to the Examination Center, and scanned (most examinations are in the form of objective tests) in Jakarta. This centralized system of examination results data processing has resulted in long processing time.

The printout of the computer-generated scores of the objective style tests, along with the mid-term assignment scores, are sent to faculties/academic departments for grading. The examination grades are stored by the Examination Center into student record database. The essay examinations, once they are received from the regional offices, are directly sent to the respective faculties to be evaluated and graded. The grades are then sent to the Computer Center to be stored in student record database. The final student grades for each course are printed out by the Computer Center and approved by the faculties (the Head of Academic Departments). The approved grades are mailed to individual students by the Distribution Center, and a copy is sent to regional offices for back-up information. Any problems related to unsatisfactory grades are to be settled through regional offices. The mechanism of the examination can be seen in Figure 4.

The primary problem with regard to examinations is the long turn-around time. The examination results, which are promised to be announced within 10 weeks after the examination time, are most often delayed. This has caused a circular problem for UT. Students, although they have been told that they can register for their other courses despite their passing/failure in the last courses, usually wait for their grades before re-registering for other courses. The delay in the announcement of examination results makes students register really late yet still eligible for the subsequent immediate examination time. Late registration means late data for course delivery estimation. This in the past has caused problems because students can not get the registered course materials in time for their next examination.



## Summary

Universitas Terbuka (UT) is a nationwide institution offering distance learning opportunities to all Indonesians. The organization, although it has regional offices throughout the country, is highly controlled and managed by the Head Office located in Jakarta. For its operation, UT collaborates with other institutions especially for its distribution of registration packages, course delivery, and conduct practicum and examination. As seen in the previous figures, communication both within the HO and between the HO and the ROs relies mostly on conventional mode such as mail and face-to-face meetings.

UT's learning materials are mainly print-based with some audio-video and computer-based materials. The use of computer networking including the Internet is still limited. The extensive use of computing is mostly for data processing such as for maintaining student records (the Computing Center) and scoring examination results (the Examination Center). Even though all units in the HO are connected to UT's Local Area Network (LAN), the HO has not yet electronically connected to the ROs. Only a few ROs are already equipped with facilities to access the Internet. All services and materials that are provided and distributed through the Internet, such as academic journals (published by UT's Research Center at <http://psi.ut.ac.id/journal>), abstract of research findings (<http://psi.ut.ac.id>), supplementary learning materials (for about 150 courses out of about 700 offered courses), tutorials (for about 50 courses), and past examination results (one semester behind) are developed and managed by academic staff at the HO.

Management of daily activities is mostly centralized at the HO in Jakarta. Except for organizing face-to-face tutorials, the ROs do not have any authorization or equipment to plan and conduct other academic activities. Table 1 summarizes the division of authorities and responsibilities between the HO and the ROs in carrying out UT's main activities.

Table 1. Management of UT Main Activities

No	Activities	Unit in Charge		Unit in Charge in the HO
		HO	Regional Office	
Registration				
1	Registration Processing	✓		Computing Center
Course Development & B Delivery				
2	Print-based Materials	✓		Acad. Department
3	Audio-Video Programs	✓		P2M2*
4	Computer Assisted Instruction (CAI)	✓		PAU*
5	Web-based (Internet-based) materials	✓		P2M*
6	Print-based Course Delivery	✓	✓	Distribution Center
Learning Supports				
7	Face-to-face Tutorials		✓	
8	Written Tutorials by Mail	✓		Acad. Department
9	Radio Tutorials	✓		P2M2
10	Internet & Fax-Internet Tutorials	✓		P2M
11	Face-to-face Academic Administrative		✓	

No	Activities	Unit in Charge		Unit in Charge in the HO
		HO	Regional Office	
	Counseling			
	Examination			
12	Item Development	✓		Acad.Department
✓ 13	Examination Set Preparation	✓		Exam Center
14	Conduct of sit-in Examination		✓	
15	Scoring Assignment		✓	
16	Scoring Examination	✓		Exam Center
17	Grading	✓		Acad.Department
18	Announcement of Grades	✓		Computing Center

\* P2M2: Center for Media (Audio-Video) Production; PAU: Inter-University (and Instruction Support) Center; P2M: Center for Media Research and Development (Internet-Based)

Finally, the discussion of this chapter suggests that UT's problems, which are mostly related to registration, learning support, and examination issues, are by and large the result of:

- the lack of a fast reliable two way communication channel/system between the HO and the ROs;
- the lack of a comprehensive data management system accessible to all staff in both the HO and the ROs; and
- the unbalanced division of authorities and responsibilities between the HO and the ROs.

As stated earlier, this rather centralized operational management system has resulted in inefficient and inaccurate decisions and operational actions.



# THE CONCEPTUAL DESIGN OF AN INFORMATION AND COMMUNICATION TECHNOLOGY-BASED (ICT-BASED) MANAGEMENT SYSTEM

## - Framework of Issues to Address

There are many reasons for Universitas Terbuka (UT) to make substantial changes in its management system. As extensively discussed in the previous chapter, UT faces problems, which are mostly, related to registration, learning support, and examination issues. Those problems seem to be somewhat caused by the highly centralized, bureaucratic management system, and the limited physical infrastructure (for both data management and communication). Although UT was established during the second-generation era of distance education, it is still relying on the first generation's method of correspondence or print-based materials. The management of the institution replicates that of the British Open University (BOU), which follows the industrial organizational model. It is, among other things, characterized by an emphasis on economies of scale, division of labor, hierarchical management, and standardized bureaucratic policies and procedures across all divisions, with a high degree of central control (Bates, 1998).

It would be beneficial to further analyze those identified problems and the underlying timeless issues. Timeless issues relate to the fundamental assumption of the administrators that influences the values of the institution (Bunn, 2001). The timeless issues are usually manifested in policies, practices, and the behaviors of the staff. UT's current policies seem to root in the administrators' (or better UT's founders and designers') assumptions about the nature of distance education and students. The myth of distance education as a cheaper method than the traditional face-to-face education seems to have influenced UT's policies on the media selection. Although it is confirmed by the situational context of Indonesia, this belief has somehow hindered the motivation to fully explore the feasibility of other more costly educational media. Furthermore, it seems that students have been viewed as one group of people with the relatively similar personal, geographical, and situational characteristics. More specifically, students all over the country, despite their visible differences, have been assumed to have the following same characteristics:

- They are working adults who have had previous learning experiences and understand the demand for independent learning style required by distance education system;
- They live in rural areas and have limited if no access to high information and communication technologies (ICT); and
- They come from a relatively low economic class.

These assumptions have had implications on UT's policies and have caused persisting problems for UT. Table 2 shows the implications and problems in relation to the above assumptions about students.

Table 2. Timeless Issues and Their Implications on Policies and Problems

Timeless Issues	Implications	Problems
<ul style="list-style-type: none"> <li>The belief that students are working adults who have had previous learning experiences and understand the demand for independent learning style required by distance education system.</li> </ul>	<ul style="list-style-type: none"> <li>Policy of no pre-admission assessment on students' readiness for distance learning.</li> <li>Policy of no specific orientation or remedial programs to prepare new enrollees for independent learning style.</li> </ul>	<ul style="list-style-type: none"> <li>Low passing rates;</li> <li>Low persistence rates; and</li> <li>Low graduation rates.</li> </ul>
<ul style="list-style-type: none"> <li>The assumption that students live in rural areas and have limited if no at all access to high information and communication technologies (ICT).</li> </ul>	<ul style="list-style-type: none"> <li>The policy of using one same standardized conventional and print-based administrative and instructional systems for all ROs across the country;</li> <li>Interaction between the students and the instructors (such as in tutorials) is designed to be voluntary-based.</li> <li>Students are treated as one same group regardless of their differences in both learning style and accessibility to ICT, such as in the use of print-based format for both instructions and communication/interactions.</li> </ul>	<ul style="list-style-type: none"> <li>Timely operational (e.g. registration and examination) processes resulted in long turn-around time.</li> <li>Inefficiency and unsatisfactory provision of (learning support) services for students.</li> </ul>

Those timeless issues are now challenged by more timely issues, which arise due to changes in the working environmental conditions and have posed both a threat or an opportunity. According to Bunn (2001), an institution must respond to the timely issues quickly in order to offset the threat or to take advantage of the opportunity. For UT, there are at least two most recognizable timely issues: the challenges posed by the rapid development of ICT and the competition UT has to face with other institutions offering distance learning programs in Indonesia.

The rapid development of ICT in Indonesia poses both an opportunity and a threat. It is an opportunity because it can help UT enhance and improve both its academic and administrative management systems. However, it is also a threat since UT is neither yet ready for nor capable of taking advantage of its potential use. Furthermore, with the increased access to the Internet, any institution in the world can now enter the Indonesian market and therefore become UT's competitors. Competition will also come from other Indonesian universities. UT has been fortunate to monopolize the distance learning market in Indonesia

for over 15 years. However, with the new government regulation, other universities, which were before not allowed to offer distance learning courses, are now permitted to do so. These timely issues have to be responded to quickly if UT wants to maintain or even increase its market share. Responding to these timely issues is especially important since it can as well simultaneously solve the problems caused by the timeless issues presented in Table 2.

Based on this framework of thinking, it seems apparent that the fundamental question for UT is: **how ICT can be utilized to develop a more student-oriented distance education system, which recognizes the different characteristics of students. A management system that would enhance the effectiveness and efficiency of registration, learning support provision, and examination processes.** An acknowledgement of different characteristics of students would have to also mean an acknowledgement of the different situational characteristics of the local area within which they live, i.e. the service area of the regional offices. This leads to the need for further discussion about the issue of centralization and decentralization between UT's HO and ROs.

### **Centralization versus Decentralization**

The most dilemmatic management issue within distance education institutions is the difficulty of managing at a distance the regional offices while maintaining their effectiveness. As in any other regional offices of an open university, they are developed to support academic programs and to increase the institution's responsiveness to students' needs. UT's regional offices also represent a local presence of the institution and to provide what Paul said as a "human face" of the system (Paul, 1990). To students, the regional office is the "UT". On the contrary, to the administrators including those in the regional offices, the "UT" is the Head Office as the regional offices merely act as technical units. All policies regarding both academic and administrative matters are made by the Head Office and thus standardized for all regional offices across the country.

This centralization system has helped UT to achieve the common goal and to allocate the available resources for the whole organization. UT's top executives believe that the common standardized policies and operational procedures will encourage clear direction, coherent goals, and achieve economies of scale. However, facts have suggested that this centralized system has also decreased the degree of responsiveness of the regional offices due to their lack of authority and capability of making quick decisions. Most of the time, staff of regional offices has to first confirm every response they want to give with the respective units/persons at the Head Office. Consequently, students would have to go through a lengthy process for getting answers to their questions and needs. To be effective, a regional office must offer coordinated and responsive service to the local students. It means that the local manager requires considerable power and autonomy over the range of services offered (Paul, 1990). In other words, UT needs to apply a more decentralized management system so that it will

increase regional offices' staff personal responsibility and ownership, and their capability to provide quick responses to local student demands.

Headquarters and regional offices are tied to each other and to the whole management system, their local responsibilities need to be coordinated and in line with the overall management goals. Therefore, coordinated and resources need to be based on the latest and valid data and information across the institution. This in turn requires both a comprehensive centralized database and a distributed database system, which will provide the same exact data to all regional offices so that they can make well-informed decisions about issues that they encounter locally.

Based on this, the goal is thus to find an appropriate balance between the centralized and decentralized system and the employment of the two systems. With the rapid changes in technology applicable for education today, an organizational structure encompassing a mix of centralized and decentralized strategies is required (Dafar, 1998) and feasible to establish.

The distance education consortium models such as that of the FCCDLC (see Appendix 1) provides an example of the highest degree of decentralization management system. The FCCDLC as a distance education institution serves only as a facilitator and deals only with statewide policy making and initiatives, while the management styles of individual colleges resemble that of UT's Head Office management. Furthermore, the larger management system (i.e. the overall Florida system) of distance education resources provides an excellent example of a mix of centralized and decentralized management. It also shows the effective use of extensive ICT, which has proven to elevate some of the daily workloads and to increase its decentralization system.

The operational scale of UT resembles that of the Florida's distance learning system. The number of distance learning students of the 28 community colleges within FCCDLC is about 187,139. Appendix 2 shows the number of UT's students by its regional services' area and the number of students of community colleges in Florida. As UT's students, Florida's distance learning students are also spread throughout the state, and some students may even live outside the state of Florida. UT's regional offices are parallel to the individual colleges that are scattered throughout the service area. The Head Office of UT can be viewed as parallel to the consortium. Nevertheless, unlike UT's head office, which governs the regional offices, the FCCDLC only assists and facilitates collaboration among the colleges and between the colleges and any external institutions. As shown by the Florida system, the use of ICT for connecting all the participating community colleges and the learning resources is imperative for both administrative and academic purposes.

Figure 1-7of Appendix 1, which shows the relationships among the community colleges and the other institutions that provide statewide services for students, depicts the division of responsibilities within the system. From students' point of view, the responsibilities, which are

represented by the services offered to students, can be depicted in Table 3. As shown by the table, the online systems are centralized and are mainly intended to provide learning supports to students (both distance learning and on-campus students). Although this table can provide UT with an example of which responsibilities should be centralized and be decentralized, it is also imperative for UT to first investigate the staff perception about this matter. In fact, most of the staff already acknowledges the need to decentralize some of the responsibilities currently carried out by the Head Office to the Regional Offices.

Table 3. Division of Authorities and Responsibilities between the FCCDLC and the Community Colleges

Nature of System	Services	Provider
Centralized System	<ul style="list-style-type: none"> <li>▪ Online catalog*</li> <li>▪ Online Academic Advising and Tracking Records</li> <li>▪ Online Library Services</li> </ul>	<ul style="list-style-type: none"> <li>▪ FCCDLC</li> <li>▪ FACTS</li> <li>▪ FCCLA &amp; DLLI</li> </ul>
Decentralized System	<ul style="list-style-type: none"> <li>▪ Pre admission counseling</li> <li>▪ Admission and Registration</li> <li>▪ Course delivery and instructions</li> <li>▪ One-to-one student-instructor/mentor/counselor interactions</li> <li>▪ Examinations and grading</li> </ul>	Individual Community Colleges

FCCDLC: Florida Community Colleges Distance Learning Consortium

FACTS : Florida Academic Counseling and Tracking for Students

FCCLA : Florida Center for College Library Automation

DLLI : Distance Learning Library Initiative

\*Data are entered by individual college

The result of a survey to identify which UT's (student-related, instructional, and organizational) activities should and should not be decentralized to regional offices is presented in Table 4. The questionnaires were distributed to every unit in the Head Offices (the Head of the respective unit) and to all Regional Offices (the Head of the office and one staff). The respondents of the survey who completed and returned the questionnaire represent both academic and administrative staff in both the Head Office (22 persons or about 69% of the total Head Office respondents) and the Regional Offices (39 or about 61% of the total Regional Offices' respondents). The numbers within the cells represent the percentage of respondents who perceived that the respective activity (in the first column) should be centralized by the Head Office (column 2), decentralized to the Regional Offices (column 3), or collaboratively conducted by both the Head Office and the Regional Offices (column 4).



Table 4. Staff's Perception about Centralization/Decentralization of Activities

Activities	Centralized	Decentralized	Collaboratively
<b>Admission</b>			
Admission and Registration	2	78	20
<b>Course Development and Examination</b>			
<b>Course Development:</b>			
▪ Print-based Courses	64	-	36
▪ Print-based Supplements	44	5	51
▪ Audio & Video Programs	84	-	16
▪ CAI	78	6	16
▪ Web-based (Internet-based) Courses/Supplements	70	5	25
<b>Student Services</b>			
Provision of Tutorials:			
▪ Face-to-face	2	75	23
▪ Mail	15	22	63
▪ Radio	18	23	59
▪ Internet and Fax-Internet	58	7	35
Face-to-face Advising and Counseling	2	58	40
<b>Examination</b>			
Item Development	57	5	38
Examination Set Preparation	67	7	26
Conduct of sit-in Examination	-	-	-
Scoring Assignment	3	71	26
Scoring (Scanning) Examination	52	19	29
Grading	68	16	16
Announcement of Grades	28	25	50
<b>Academic Administrative</b>			
Student Records Maintenance	11	16	73
Transcripts	37	37	26
Graduation Ceremony (Convocation)	3	27	70

Table 4 shows how far UT's staff wants to decentralize the authorities and responsibilities to carry out UT's main activities. It is interesting to see that most of the activities were still perceived to be better managed by a centralized system. Only admission and registration (78%), the provision of face-to-face tutorials (75%), face-to-face advising and counseling (58%), and scoring assignments (71%) were perceived by most respondents to be better off with a more decentralized system. Among these activities, only the first one is different from the management of the current system. Furthermore, the relatively high percentages in the last column also suggest that many staff believe many activities should be managed collaboratively by both the Head Office and Regional Offices. This is the part where ICT can play an important role within the system. The use of ICT, as it was exemplified by the Florida's system, can seamlessly integrate the works autonomously performed by both the Head Office and the Regional Offices. **The use of various ICT applications will also provide all participating management units within UT to use the same data and information stored and maintained in a centralized comprehensive database for any decentralized decision makings in the day-to-day operations.** In other words,

comprehensive use of ICT will enable UT to develop a balanced centralized/decentralized management system.

Moreover, the use of ICT at the same time would also improve the quality of students' learning process. The existence of two-way communication channel (both synchronous and asynchronous) through ICT would bridge the communication gap between students and tutors and among students themselves. Providing students with the opportunity to use the technology in their study activities is also an important benefit. As we all know, information technology is becoming central in everyone's work and life. Acknowledgement as competent professionals would likely to be based on the competency of communicating (with other professionals) through e-mails and of seeking knowledge through browsing in the World Wide Web. Thus, integrating ICT into the instructional process would also provide students with the skills they will need in their work and life (Bates, 1998).

In summary, **the conceptual design of a balanced centralized/decentralized management should comprehensively encompass the use of ICT within the system.** In other words, the concept of a balanced centralized/decentralized management system would be one of an ICT-based management system.

#### **The Vision of ICT-based Management System**

Stating the vision is very essential, as it would serve as a barometer to everyone involved. It is also important to note that the vision of technology use should "nest" within a larger strategic plan of the institution as a whole (Bates, 1998). Therefore, it is important to formulate the vision for an ICT-based management model within the current UT's vision as it is stated in its Strategic Plan 1999-2003 (Universitas Terbuka, 1998). The stated vision is:

*To become the center of excellence in developing, organizing, and researching open and distance learning in Indonesia.*

The vision is further elaborated by several missions including widening access to higher education by utilizing appropriate technologies for the teaching and learning process. Appropriate technologies mean those that are accessible and affordable to both the institution and targeted students, as well as suitable for both the administrative and academic/instructional needs. That is not to respond to the "technological imperative" but to cope with the today and future challenges; and, to increase UT's competitiveness so that it would become the center of excellence for open and distance learning practice within Indonesia. Harnessing the utilization of ICT at UT is also deemed appropriate since the physical infrastructure has now been established by other institutions making access to ICT relatively easier and user friendlier (see Hardhono & Belawati, 1998).

With this larger vision in mind and based on the research objectives, the proposed ICT-based management model for UT will be focused on a mix of centralized and decentralized systems of registration, course development and delivery, learning support services, and examination through the use of ICT. That is, ICT will be utilized not to completely replace but rather to automate some of UT's operational processes in conjunction with the current conventional procedures.

### Proposed Design of the ICT-Based Management System

The extensive use of ICT in Florida's distance learning system has enabled the State to comprehensively integrate all the resources available and make them available all citizens. The system also shows that ICT has enabled the system to maintain shared and decentralized development and maintenance of different resources and services among different institutions/entities. Based on the example of the FCCDLC networking and staff's aspiration presented in Table 4, Table 5 outlines the proposed vision of a balanced centralized/decentralized operational management system, and the role of ICT in it.

Table 5. Proposal for the Division of Responsibilities between the Head Office and the Regional Offices

Operational Activities	Head Office	Regional Office
Academic and General Administration	<ul style="list-style-type: none"> <li>▪ Develop and maintain one centralized and comprehensive information system database for student records, courses, and other operational data</li> <li>▪ Develop and maintain one institution-wide computer network through the use of Internet connection</li> <li>▪ Train staff to use the database and the related institution-wide computer network system</li> <li>▪ Develop and maintain online training programs for both academic and administrative staff</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop an operational management system to use the central information system database and the institution-wide computer network</li> <li>▪ Assign staff to regularly participate in the online training programs</li> <li>▪ Conduct local training programs to increase the office's service quality and its responsiveness to students' demands</li> </ul>
Admission and Registration	<ul style="list-style-type: none"> <li>▪ Develop promotional materials</li> <li>▪ Establish and maintain online promotion programs</li> <li>▪ Develop an online self-assessment for distance learning readiness</li> <li>▪ Develop and maintain online catalog</li> <li>▪ Develop and process online registrations</li> <li>▪ Develop an online payment system</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conduct local promotions to recruit new students</li> <li>▪ Help students complete the self-assessment for distance learning readiness.</li> <li>▪ Provide face-to-face pre-registration consultation.</li> <li>▪ Receive and process registration (submitted to the office) through the online registration system</li> <li>▪ Print-out and send online registration confirmation to students</li> </ul>
Course Development and Delivery	<ul style="list-style-type: none"> <li>▪ Develop a restricted online environment for course development</li> <li>▪ Develop web-based courses and supplementary learning materials</li> </ul>	<ul style="list-style-type: none"> <li>▪ Distribute and sell print-based course materials, audio programs, and video programs</li> </ul>

Operational Activities	Head Office	Regional Office
	<ul style="list-style-type: none"> <li>▪ Establish an Internet-based delivery system for print-based course materials</li> </ul>	
Learning Supports	<ul style="list-style-type: none"> <li>▪ Develop an online study guide</li> <li>▪ Develop and provide web-based tutorials and counseling</li> <li>▪ Establish Internet-based broadcast (for audio and video programs)</li> <li>▪ Establish and maintain an online advising and credit transfer system</li> <li>▪ Develop an online system for request for transcripts</li> <li>▪ Establish a digital library system</li> </ul>	<ul style="list-style-type: none"> <li>▪ Organize face-to-face tutorials</li> <li>▪ Provide face-to-face advising and counseling</li> <li>▪ Provide assistance to students to use the online learning supports</li> </ul>
Examination	<ul style="list-style-type: none"> <li>▪ Develop test items</li> <li>▪ Establish an institution-wide centralized item bank</li> <li>▪ Develop a restricted online environment to generate self-test and examination sets</li> <li>▪ Establish a secured Internet-based data transfer for self-test and examination results/scores</li> <li>▪ Establish a restricted online environment for grading and item analysis processes</li> <li>▪ Establish an online grade announcement system</li> </ul>	<ul style="list-style-type: none"> <li>▪ Retrieve and duplicate self-test and examination sets</li> <li>▪ Distribute the self-test/assignment to students during face-to-face tutorials</li> <li>▪ Collect and score the self-tests/assignments</li> <li>▪ Enter the self-tests score into the restricted system for grading</li> <li>▪ Organize sit-in and supervised examination using a special pencil and paper</li> <li>▪ Scan the examination results, which data will be automatically transferred to the restricted system for grading</li> </ul>

The above table shows that the system is proposed to keep the centralization of the ICT-based activities and decentralize the works that are more "human-based" in nature. The centralization of the ICT-based activities is perceived suitable for UT since it will require a high investment on the physical and human infrastructure. As shown, unlike the FCCDLC system which decentralizes the admission and registration as well as the examination activities, UT will have a mix of centralized (through online system) and decentralized (through ROs) systems for those activities.

A similar management system proposed for UT has been applied by some other consortia such as the Colorado Community College Consortium Online Programs (CCOnline), the Western Governor University (WGU), and Open Learning Agency of British Columbia (OLA). In these institutions, the decentralized activities are mostly those related to student services only. Figure 5 depicts the vision of the nature of relationships and communication between the administrators (in both HO and ROs) and the students.

As shown by Figure 5, the proposed mix of centralized and decentralized management system would integrate the new automated (ICT-based) management processes and procedures with the current manual system. This would not really change the organizational structure of UT. The difference would be in the existence of a centralized and comprehensive

information system database that is accessible to administrators and academic staff in both the HO and ROs. Therefore, despite the different locations of the HO and the ROs, administrators and academic staff would access and use the same data and information. Access to the same information system database would empower administrators and academic staff at the ROs. It would then enable the authorized staff to make decision making and take actions, without depending on the HO's staff like in the current management system. The ability to make well-informed decisions and to take immediate action would enhance the system's responsiveness to students' demands. This will also expect to increase the ability and confidence of ROs' administrators and academic staff, and ultimately to enhance their sense of responsibility to providing excellent services for students. Finally, the above-shared responsibilities will expectedly result in a comprehensive manual and online services for students.

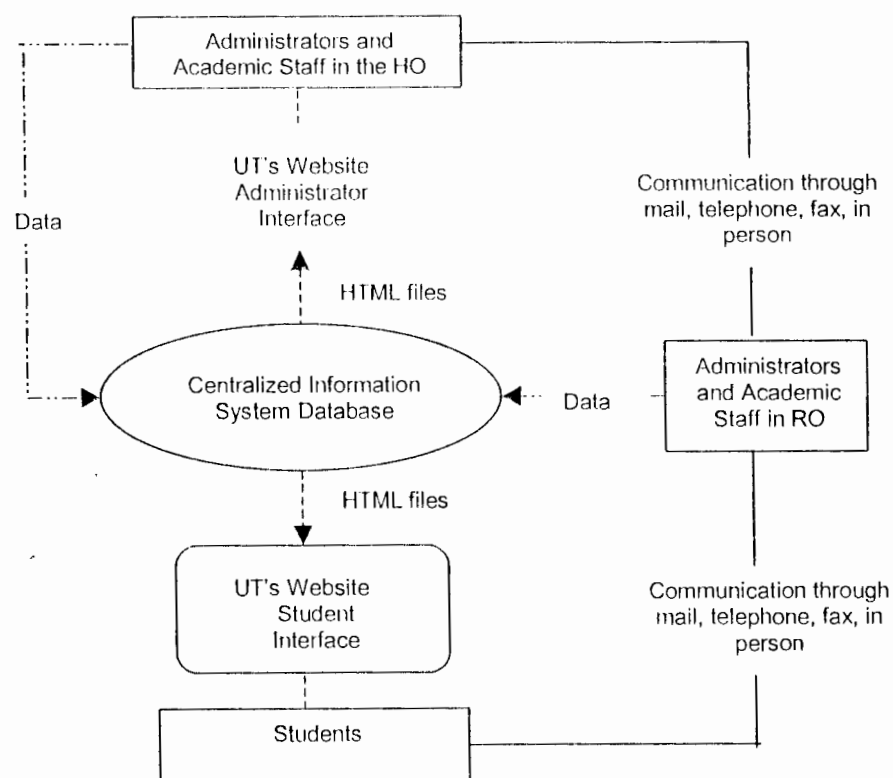


Figure 5. The Nature of Relationships and Communications between UT and the Students

Figure 6 specifically outlines the online services that can be made available by the ICT-based management system. As the figure shows, services of the ICT-based management system can be presented through one centralized portal (i.e. UT Web Site) with two interfaces: the student's interface and the administrator's interface.

As in FACTS, FCCDLC, and FVC online services (see Appendix 1), UT's online academic service will allow students and prospective students to shop for UT's academic programs and courses (catalog), to get pre-registration counseling (including to do self-assessment for distance learning readiness), to get assistance regarding their eligibility to register in a program (student tracking and credit transfer), to register, to seek help and advice during the learning process, to view their grades, as well as to get unofficial transcripts. Some services might want to be designed restricted for certain users such as the top management only, faculty only, etc.

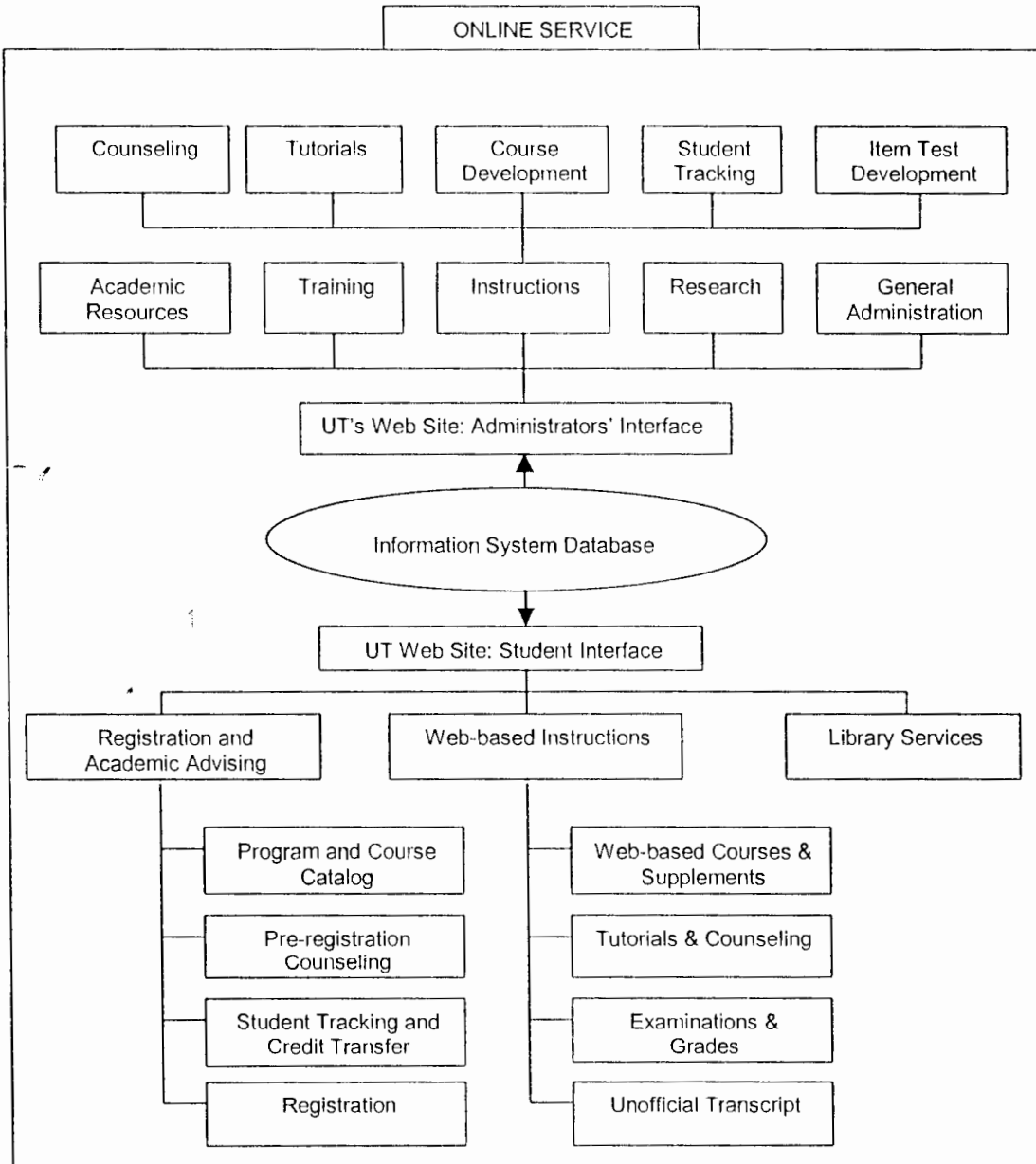


Figure 6. Outline of UT's Online Service

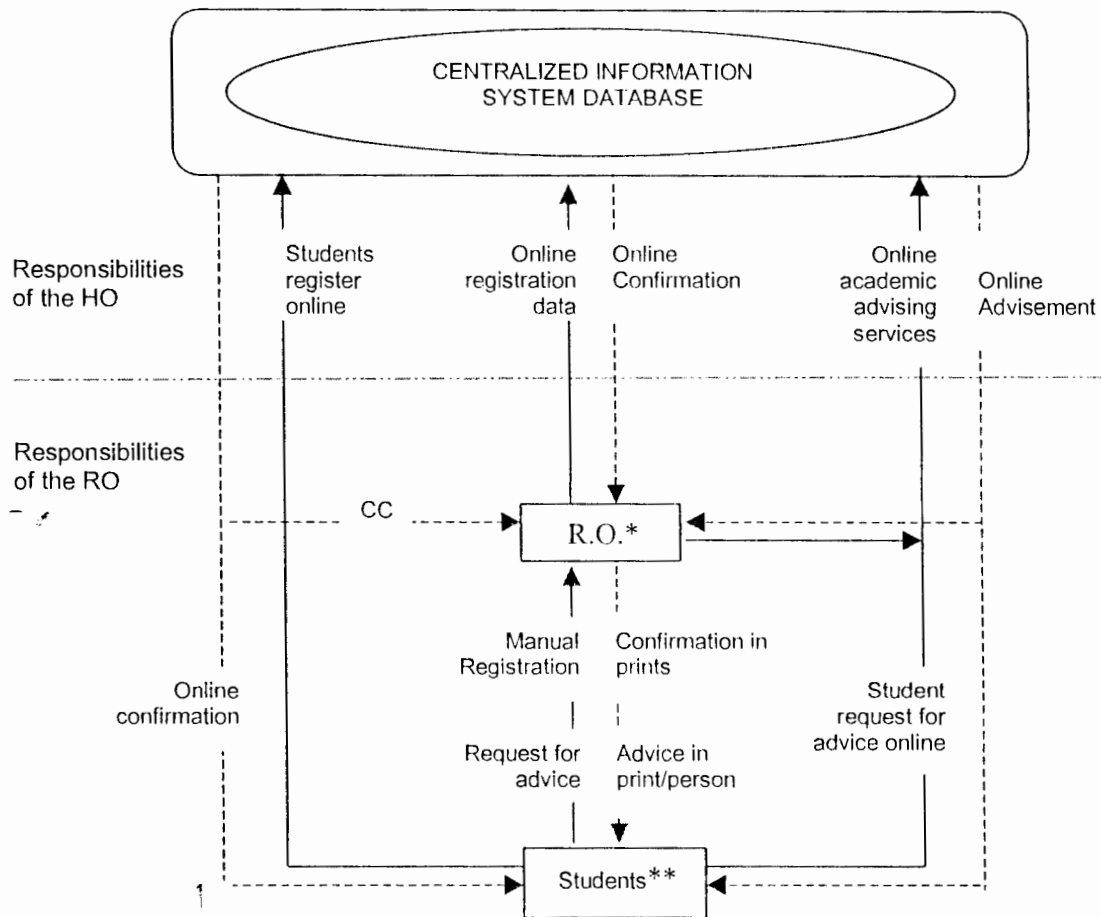
From the administrators' interface, the system will allow academic staff to develop course materials and item tests using an online environment, to conduct instructions (including tutorials), to track students' study progress, to provide counseling, to conduct collaborative research, and to look for academic resources (including library services). The online system will also allow UT to develop and conduct online staff training and will enable staff to carry out automated academic and general administration activities.

As seen, the use of ICT for automating the operational system would enable UT to transfer some of the work usually 100% done manually to be done automatically. The automation however is not to eliminate nor entirely replace the existing system, rather to compliment and extend the system services. This is to acknowledge that some students still do not have access to the online services, or still prefer the more traditional way of going to the regional offices for service they need. This combination of manual and automated mechanisms will enhance the quality and punctuality of UT registration, learning support, and examination services. With this automation system built in to the existing more conventional system, UT will be able to better serve its students as well as expand its reach-out.

Specifically for the registration and learning supports system, Figure 7 depicts the nature of procedures and data communication of the ICT-based system. As the figure shows, students will have the flexibility of registering manually or electronically. In the current registration system, students have to submit their completed registration forms to one of the regional offices through mail or in person. Within the new system, students will be able to either register manually as usual or electronically through the online system. Registrations submitted to the regional offices will also be keyed in to the online system by regional office staff. That way, the registration unit at the Head Office will only have to manage one system, which is the electronic system. Data entered into the online registration system will automatically create a student account in the Student and Course Database. In turn, this record will be available for the system to provide the online learning support such as academic counseling to students. The online service will be accessible to students through the Internet or through any regional office staff (who then will take advantage the online service as well).

The new system would also be designed to be facilitating development and delivery of both print-based and non-printed materials. The nature of the design for this matter is shown by Figure 8. As shown, online courses would be able to be accessed directly from students' computer systems. Nevertheless, the non-online courses such as print-based, audio, and video materials can be purchased both through ROs and through the online system. The purchase of course materials through the online system will be done through a secured system which will require proof of payments. Once the proof of payment is received by the system, the materials can be downloaded and may be printed out. In case of manual request of course materials through ROs, the ROs' staff would then be the person who do the

downloading process. Due to its requirement for high quality of computer hardware, audio-video programs may still be best delivered through mail or courier services.



\* R.O.: Regional Offices

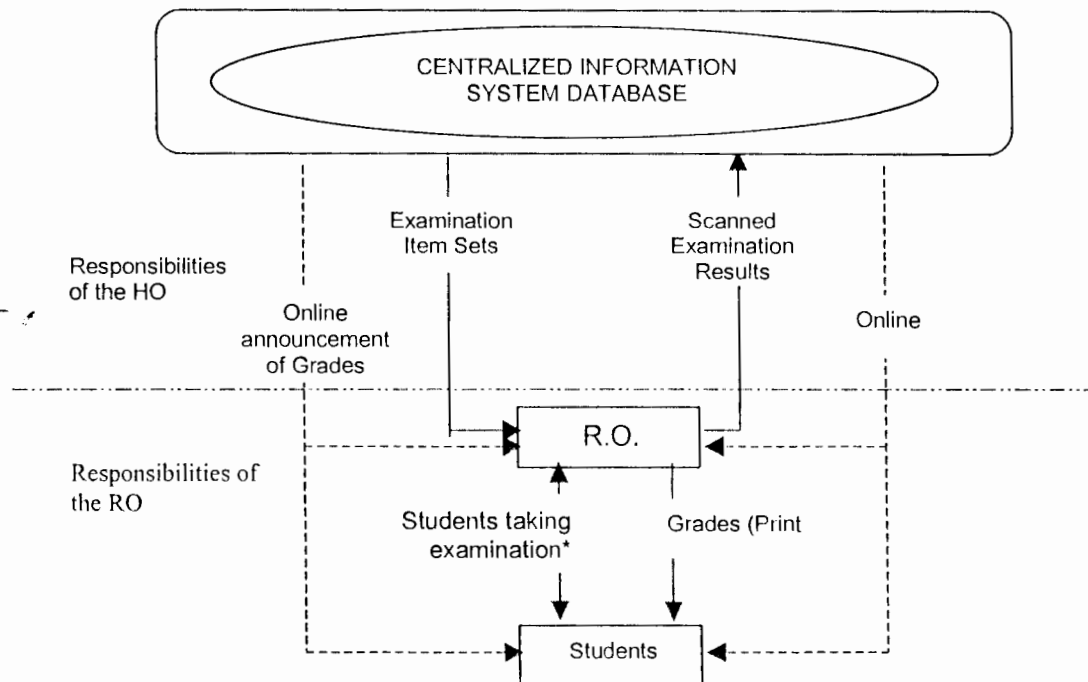
\*\* Students may access the Internet from their homes, work places, Internet Kiosk (WARNET), study centers (to be established), UT's Regional Offices (to be equipped with Internet facilities). Collaboration with the WARNET Association (AWARI) may open the possibility of utilizing WARNETs as UT's resource centers.

Figure 7. The Nature of Communication of the Registration and Advising System

This system would of course require all print-based course materials to be developed in digital forms and stored in the centralized information system database. The significant advantage of this system is in the decentralization of course materials duplication. As previously discussed, the inconsistent and delayed data of the number of students enrolling in particular courses has often caused confusion about how many copies of course materials should be sent to which RO. This has resulted in either unavailability of course materials in some ROs, and copious in some other ROs. By giving the authority to the ROs to duplicate the course materials locally, it will significantly decrease this problem. With the course materials stored



in the database, ROs can print and duplicate course materials according to the local demands. Furthermore, students who have the necessary access and facilities can also purchase the print-based materials directly through the online services. Finally, the combination of ICT-based and manual course delivery will expectedly reduce the process of course materials delivery.



- Examinations are organized as supervised pencil & paper tests in examination locations, which include but are not restricted to local university and school premises. Supervisors of examination are best selected from local university faculty/lecturers

Figure 9. The Nature of Communication of the Examination System

With reference to examination, Figure 9 depicts the nature of procedure and data communication of the integrated manual and automated examination system. The manual procedure will be carried out through the Regional Offices as in the current system. This system will expectedly reduce the turn-around time of the examination and the announcement of the examination results. Unlike the current system that announces past examination grades only through the Internet, the systems will automatically make both previous and the most recent examination grades to be viewed through the Internet.

As shown by Figure 9, the examination would still be designed to be sit-in and closely supervised tests. Like in the current system, the examination items would still be developed and stored at the HO, and the conduct of the examination would be organized by the ROs. Nevertheless, unlike the current system, the ROs would now have the authority to duplicate the pre-developed (by authorized academic staff at the HO) examination item sets and to

scan of the completed examination sheets. This of course would require the ROs to be equipped with a secured scanning system and procedures. To enhance the security of the examination, UT should use "inerasable" computer sheets so that nobody can change the answers already marked by the students during the examination times. Furthermore, the scanning should also use a system which will transfer data of an individual sheet /scanned score directly and automatically to the centralized database at the HO. This way, no one besides the authorized staff can change the score once a sheet has been scanned.

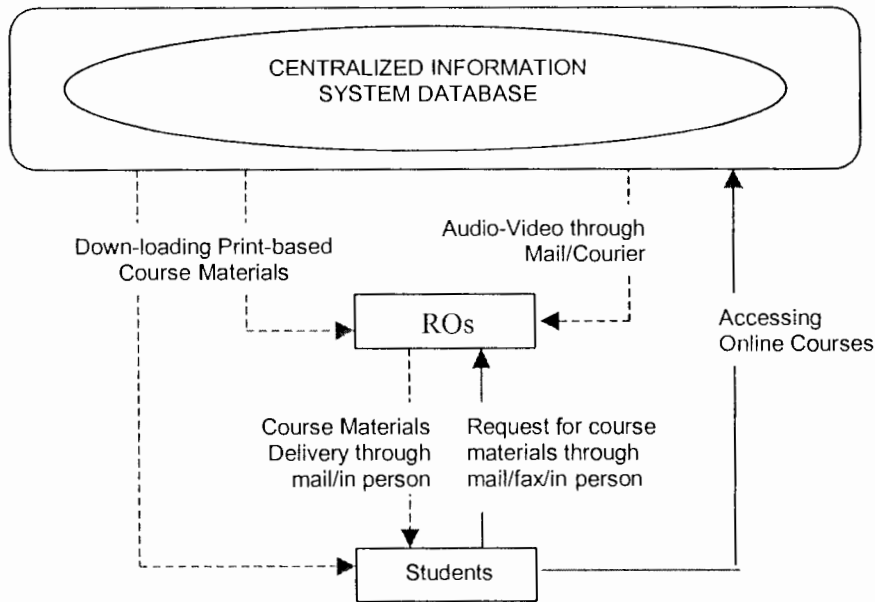


Figure 8. The Nature of Communication of the Course Materials Delivery System

Figure 7 and 9 also present the nature of how student services are integrated into the registration and examination system. The information system database will consist of several management tools to handle online registration, online course delivery, online student services, and examinations.

### Governance

As discussed earlier, the proposed ICT-based management system will provide the university with a comprehensive database system that will increase the transparency of information. This is very important since UT will have to comply with the new government paradigm of university governance.

As with any other higher education institutions, the basic structure of UT is bureaucratic and mostly based on government regulations. The administrators of a public university such as UT are responsible to the government, through the Ministry of National Education. Students, parents, and general community have been seldom accounted as stakeholders to whom the

university is accountable. This practice has been substantiated by the lack of communication support system within the university resulting in intransparency.

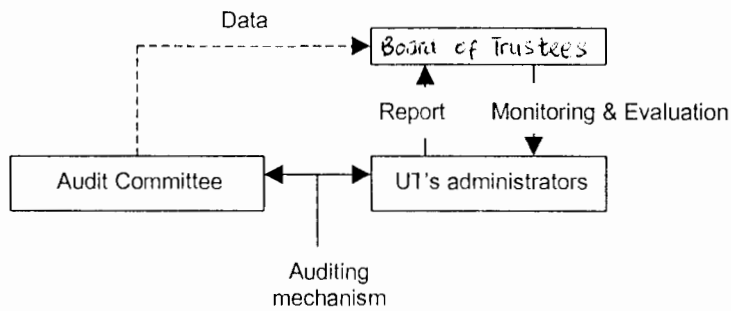
The recent changes of government regulation regarding university management will require the university to be managed using a "corporate governance" approach. Within the new paradigm, public universities are granted full autonomy and will have to be accountable to a board of trustees that consist of representatives of government appointees, students, parents, and the community. This new management approach intends to increase public universities' transparency and accountability to all stakeholders.

Corporate governance addresses the system and processes by which companies (or in this case, universities) are supervised and controlled as well as the ways "executives" account to shareholders (Choe, 1998). This will require UT to adopt standardized internationally accepted systems for financial accounting and reporting, as well as for staffing and other resource management. Nevertheless, although the new ICT-based information system would help UT meets those requirements, UT's staff does not yet have the skills and attitude of executing a corporate-like management manner.

In accordance with this, the implementation of the proposed ICT-based management system would have to be simultaneously conducted with a constructive effort to building a corporate management skills and attitude among the executives and administrators. The effort would include training and development of internal monitoring instruments such as standardized forms of/for:

- balance sheet and cash flow statements of every unit/department ;
- report statements that compare current period and year-to-date performance to target performance and previous year performance;
- administrators' comments about current performance that focus on explaining the deviations from the target performance and revise performance targets for the remainder of the fiscal year;
- minutes of meetings;
- employees' attitude surveys; and
- students' satisfaction and preferences surveys.

More importantly than the above issues, corporate governance requires an independent audit committee to evaluate the effectiveness of the management. This means that UT needs to modify its organizational structure. This will be in line with the new government guidelines regarding university organizational structure. As previously mentioned, the new structure would include a board of trustees that consists of representatives of government appointees, students, parents, and community representatives. Under the new structure, the organizational structure would at least include three components such as the following:



The proposed ICT-based management with its comprehensive database system will enable UT's administrators to establish a standardized disclosure of data and information to both the Audit Committee and the Board of Trustees.

### Summary

The examples of the consortium model of management system have shown that a balance of centralized and decentralized systems for managing distance learning programs is effective and efficient. The examples and literature have also shown the ICT plays an important role in this kind of management system. In a more forward term, the system can be said as an ICT-based management system.

The proposed ICT-based management system is envisioned to be a mix of centralized and decentralized systems of registration, course development and delivery, learning support services, and examination using ICT. That is, ICT will be utilized not to completely replace but rather to automate some of UT's operational processes in conjunction with the current conventional procedures. This proposed system is expected to enhance UT's responsiveness to student's demands at local areas through ROs, and at the same time to achieve the common goals of the whole institution.



## PREPARATION FOR THE IMPLEMENTATION

The new ICT-based management system proposed earlier is based on a vision that is derived from the institution's larger vision. As mentioned earlier, a vision is the picture of what the institution is going to like when the proposed system is fully implemented. That picture is expected to enforce all stakeholders to contribute in their capacity for the achievement of the institutional goals; and especially for the implementation of the system that is designed to accelerate the achievement of those goals. Accordingly, sharing the vision with everyone to be involved is the most important thing to do for implementing a new and innovative system.

It is difficult to gain acceptance of a new way of doing things, especially if the people are not involved in formulating the vision. On the other hand, it is also extremely difficult to involve everybody in the process of developing a plan and much less in formulating a vision. Therefore, the best thing to do is to share the vision with key persons and to convince them about the benefit of the new system for UT's future. These key persons have to be provided with the rationale of why the new system should be developed in the first place (Bates, 1998). A great and firm leadership, which does not necessarily be one person nor top executives (Bates, 1998), would be the key to the success of this first step of the implementation.

Once the vision is shared and everyone agrees with the stated common goals, it is also imperative to involve those key persons in translating the vision and the conceptual design of the new system into a strategic plan as much as possible. It is important to always remember that within an open university context, ICT is not just a technical function, but it should be highly integrated into almost all of the university's activities. Therefore, a strategic "technology" plan should be developed carefully in accordance with the current stage of art of the institution; and the development of such a plan should involve people from across units within the university.

As a guideline, the implementation of an ICT-based management system within UT's context should be conducted upon the completion of the following preparatory steps:

1. assessment of the existing infrastructure;
2. development and upgrade the required infrastructure;
3. development of manuals and materials; and
4. pilot project the plan in a small scale basis.

### **Assessment of the Existing Infrastructure**

An ICT-based management system incorporates a highly integrated use of various technologies and requires several elements of infrastructure, i.e. physical, human support,

and funding (Bates, 1998). Although physical infrastructure is very important, it has to be linked and be simultaneously developed with the two other elements.

### 1. Physical Infrastructure

Physical infrastructure includes the hardware and the software. The hardware comprises the desktop computers, the mainframes (servers), and the physical network, which connects all the machines through cables and wires, fiber, and Ethernet. The software embraces the operating programs and routers that enable the machines and networks to function. Physical infrastructure also includes telecommunications links to the outside networking through telephone services, videoconferencing equipment, or the Internet (Bates, 1998).

Belanger & Jordan (2000) provide several basic questions to guide the assessment of physical infrastructure. In accordance with the proposed design of the ICT-based system, UT needs to answer those questions and decide what elements of the physical infrastructure need to be upgraded to implement the new system (Table 6). As an illustration, Appendix 3 shows the current technology infrastructure of Seminole Community College. This is to give some idea about the requirement of physical infrastructure for a comprehensive ICT-based system.

Table 6. Physical Infrastructure Assessment and Upgrade Requirement

Questions	Reality	Upgrade Requirement
<p>Telecommunication requirements:</p> <ul style="list-style-type: none"> <li>▪ How is the Internet connectivity?               <ul style="list-style-type: none"> <li>→ Asynchronous capability</li> <li>→ Synchronous capability</li> </ul> </li> <li>▪ How accessible is the connectivity?</li> <li>▪ How will connectivity be achieved?               <ul style="list-style-type: none"> <li>→ Modem/dial up</li> <li>→ LAN</li> <li>→ WAN</li> </ul> </li> <li>▪ How fast is the speed of connectivity?</li> <li>▪ Is Internet connectivity provided through a shared facility?</li> <li>▪ Does everyone have an Internet E-mail account?</li> </ul> <p>Desktop/LAN requirements:</p> <ul style="list-style-type: none"> <li>▪ Are all desktops connected to the LAN?</li> <li>▪ Does everyone have access to a shared file server?</li> <li>▪ Does everyone have a web browser loaded on his or her desktop?</li> <li>▪ Are web plug-ins allowed on everyone workstation?               <ul style="list-style-type: none"> <li>→ Java</li> <li>→ Shockwave</li> <li>→ Adobe Acrobat</li> <li>→ Real Audio</li> </ul> </li> <li>▪ What office productivity software does everyone have access to?               <ul style="list-style-type: none"> <li>→ Lotus Suite</li> <li>→ Microsoft Office</li> <li>→ Course development software/course management system tool</li> </ul> </li> </ul>		

Questions	Reality	Upgrade Requirement
<ul style="list-style-type: none"> <li>▪ What graphic packages does everyone have?</li> <li>▪ What type of desktop hardware does everyone have? <ul style="list-style-type: none"> <li>→ 486</li> <li>→ Pentium I</li> <li>→ Pentium II</li> <li>→ Pentium III</li> </ul> </li> <li>▪ What is the storage capacity of the desktop?</li> <li>▪ Is all desktop equipped with multimedia capability? <ul style="list-style-type: none"> <li>→ Sound card</li> <li>→ Speakers</li> <li>→ Color monitor that can display 16 bit colors</li> <li>→ Video Card</li> <li>→ Video Camera</li> <li>→ Microphone?</li> </ul> </li> <li>▪ What desktop operating system(s) does UT use? <ul style="list-style-type: none"> <li>→ Windows 3.1 or 95/98/2000</li> <li>→ OS/2</li> <li>→ Macintosh</li> <li>→ Linux</li> <li>→ Unix</li> </ul> </li> <li>▪ What network operation system does UT use? <ul style="list-style-type: none"> <li>→ Novell</li> <li>→ Windows NT</li> <li>→ Other</li> </ul> </li> <li>▪ What E-mail platform(s) does everyone use? <ul style="list-style-type: none"> <li>→ MS Mail</li> <li>→ Lotus Notes</li> <li>→ Microsoft Exchange</li> <li>→ CCMail</li> <li>→ Netscape Messenger</li> </ul> </li> <li>▪ Does UT have an Intranet (web-based access to corporate LAN and applications)? <ul style="list-style-type: none"> <li>→ What is aggregate throughout of data on LAN?</li> <li>→ What is protocol of LAN?</li> <li>→ TCP/IP</li> <li>→ Novell NetWare</li> <li>→ Microsoft NT domain</li> </ul> </li> </ul> <p>Collaboration requirements:</p> <ul style="list-style-type: none"> <li>▪ Does UT have access to collaboration user software? <ul style="list-style-type: none"> <li>→ Shared whiteboard</li> <li>→ NetMeeting</li> <li>→ Listservs</li> <li>→ Webforum</li> <li>→ Others</li> </ul> </li> <li>▪ Does UT have a server dedicated to host collaboration software?</li> </ul> <p>User Support requirement:</p> <ul style="list-style-type: none"> <li>▪ Is everyone supported by a Help Desk?</li> <li>▪ How quick is the response time when someone calls for help?</li> <li>▪ Is the Help Desk staff around the clock?</li> </ul> <p>Computer Learning Center/Lab requirements:</p> <ul style="list-style-type: none"> <li>▪ Does all students have access to a computer learning center/lab?</li> <li>▪ How many computers are installed in the center?</li> <li>▪ What is the student to computer ratio for lab use?</li> </ul>		

In addition, the proposed automation system, as shown by Figures 5 and 6, requires a comprehensive and centralized information system database. Although UT already has a



database of students' records, the retrieval access to the data is now restricted only to the staff in the Head Office. Staff at the regional offices have to require data manually (letters, faxes, telephone, or even in person) to the Computer Center. Students have no access at all to the database except for those posted in the web site. The academic matters contained in the web site are restricted only to the distribution of the academic calendar, distribution of supplementary course materials, provision of tutorial for some courses (about 50), and announcement of the past examination grades. Therefore, the existing database needs to be re-organized so that it would serve as the central data provider for all the online services to be offered. This may involve some if not substantial technical changes such as in the software and hardware<sup>1</sup>.

A further detailed technical plan should be developed involving the Computer Center and the Media Research and Development Center. The technical plan should also cover the assessment and selection or the development of the management system tools (programs) for both academic and administrative operational activities. Based on the proposed system, the technical plan should carefully lay out the integration of all management system tools, including those for registration, course delivery and management, student service, examination, and library. References for those management system tools are widely available in the WWW. For example, the Microsoft online registration system tool is available for review at <http://www.microsoft.com/technet/Analpln/Cs/Infosys.asp>. Review of different course delivery and management tools can also be found at, for example, [http://directory.google.com/Top/Computers/Software/Online-Training/Delivery\\_and\\_Manag](http://directory.google.com/Top/Computers/Software/Online-Training/Delivery_and_Manag).

Based on both the results of the assessment and the examples provided by the references, a comprehensive technical plan can then be developed. The plan can be formulated as a "Request for Proposal (RFP)", a "Request for Information (RFI)", or a "Request to Negotiate (RTN)". These are the terms for documents that contain an institution's technology-based development plan, which are used to invite different companies (vendors) to respond to them. Examples of and guidelines for developing such documents can now be found in several institution's website, e.g. <http://www.library.yale.edu/consortia/techreq.html> (see Appendix 4 for the printout of this) and <http://www.cswl.com/rfp/rfp1.asp>. However, it is important to note that an RFP embraces more complicated legal issues than the other two forms of document as it is now experienced by many institutions in the United States.

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<sup>1</sup> The technical software and hardware issues will not be elaborated in this report.

## 2. Human Support Infrastructure

There are four elements of human support required to exploit the benefits of ICT to the fullest: technology infrastructure support staff, educational technology support staff, instructional design staff, and subject (content) experts/specialists (Bates, 1998). The first two groups of support staff are needed whether or not the ICT is going to be used for the teaching and learning process. Meanwhile, the instructional designers and content experts are relevant only if ICT is used for both administration and instructional purposes

The technology infrastructure support staff is probably the most obvious one to make the physical infrastructure work. This consists of people who are responsible to properly install, operate, update, and maintain the network and equipment. The educational support staff includes the media production and services staff, such as the interface designers, graphics designers, and those who do HTML markup. This staff supports the creation and application of educational materials and programs using technology. Unlike the technology infrastructure staff, who is going to be needed whether or not technology is going to be used for teaching, the educational technology support staff is needed only when technology is to be used for teaching purposes.

The instructional design staff are those who provide educational services and expertise to support the use of technology for teaching. The services and expertise include instructional design, faculty development, project management, and evaluation. The last but probably the most important human support for teaching is the content experts. These people are responsible for creating the content and providing teaching or tutoring over the networks and infrastructure.

Within UT's context, it is essential to assess the availability of the four different groups of these human supports. As for the current situation, it seems that UT still needs to significantly increase the number and the ability of the first two elements of human supports, i.e. the technology infrastructure and the educational technology support staff. UT has already had a sufficient number of instructional design staff. However, additional training on new approaches to instructional design, especially on ICT-based instructional designs, needs to be provided on regular basis. The content experts, as in the current system, can be hired from other research universities.

Paul (1990. P. 64) suggests that staff development regarding technology use should also include the following components:

- An introduction to the mission, history, and philosophy of the institution;
- Seminars and other interactive sessions focusing on the students (who they are, what they are looking for, factors influencing their success and failure, etc.);
- Discussions about the implications of the above points;

- Informal sessions which emphasize the unique challenges of working in the new environments;
- Opportunities to meet face-to-face with students to understand better the challenges they face and the services and support to enable them to succeed;
- Seminars on time-management;
- Travel, professional development, and research funds to encourage staff to visit other open learning institutions and to develop their expertise in coping with UT's particular demands; and
- Periodic presentations of institutional research on the factors which have an impact on student success.

### 3. Funding the Technology Support Infrastructure

The cost for developing physical infrastructure is usually very high and viewed as a one-time investment. As an illustration of the amount requires for a capital investment of a technology infrastructure, Canada's University of British Columbia (UBC) devoted \$4 million a year over five years to further develop its physical infrastructure (Bates, 1998).

In developing countries such as in Indonesia, initial capital investment is therefore often funded by external sources. In the past, there are examples of this pattern of funding system. Many institutions received funding from external sources, mostly loans, to build their physical infrastructure. Once the development was completed, the funding was also stopped. The institution was expected to fund the operation and maintenance of the established infrastructure. However, most of the time, the institution does not have sufficient funding and thus the infrastructure can not be fully utilized. Based on the past experiences of other institutions, it is extremely essential for UT to carefully assess and plan the funding system for both the initial investment and the subsequent recurrent operational costs of the infrastructure. This is especially important since ICT changes rapidly and continuously, which in turn will also require continuous training for the human supports.

Questions that need to be asked include but are not restricted to:

- Where is the funding going to come from for the initial investment? Internal source or external source?
- How is UT going to get the external source funding? Loan? Grants?
- How is UT going to fund the subsequent cost for the operation and maintenance of the physical infrastructure, once the external-funding stops? and
- How is UT going to fund the recurrent cost for salary/honorarium of the human support staff?

Answering these questions will help UT's administrators develop the annual budget to ensure the smooth operation of the ICT-based management system, and to fully exploit the benefit of it.

### **Development and Upgrade of the Required Infrastructure**

Upon the completion of the assessment, UT should have a clear idea about what needs to be done regarding the whole infrastructure. It is not surprising that the list will be long and will be extremely overwhelming. At this stage, the most frequently asked question is "where to start", especially under the tight budget circumstances.

As previously discussed, the full automation system consists of several subsystems such as the registration, the course materials development and delivery, the learning support, and the examination subsystems. Each subsystem requires several technical features that need to be developed, up-graded, or procured. Accordingly, the planners and the top administrators need to comprehensively analyze the importance of each subsystem based on its contribution to the implementation of the whole system. Which subsystem and or technical feature should be developed and implemented first based on the point of necessity and the feasibility of the required budget.

This stage is crucial since it will influence the smoothness of the full implementation of the whole system. The prioritizing process should be aimed at achieving a seamless transition from the current system into the new envisioned system. For example, the necessity for the decentralization of some responsibilities to the ROs is the availability of a two-way fast and reliable communication line/means. Therefore, establishing an online connection between the HO and the ROs is probably the first step. Furthermore, the HO will need a wider bandwidth so that it will be able to connect to the external networking at a reasonably fast speed. Once the communication hardware is established, UT will then need to upgrade the existing information system database so that it will accommodate the storage and maintenance of the required data and the retrieval system. This, at the same time, will require more working stations from which the staff will perform their duties and responsibilities. The new way of performing duties and responsibilities will accordingly require further training for the staff.

This line of thought continues until the entire required infrastructure is fulfilled for the full implementation of the new system. The result of the analysis is an identification of the sequence of the steps necessary to move forward towards achieving the goals in a planned and cost effective manner, and will become the guideline to the timeframe and cost associated with the implementation of the system. This implementation guideline for the development of infrastructure can be formulated as a strategic technology plan, which will include the strategic development of the physical/technical element contained in the RFP/RFI/RTN discussed earlier, and the human as well as the funding supports elements.

There are many examples of strategic technology plan available in the WWW. Although they may not be exactly the same for all institutions, those examples can help UT develop its technology plan that best suits both the proposed ICT-based management system and the current circumstances. Some of the examples can be found at the following URL:

- <http://www.mdee.edu/ctc2000/CTCTechPlan000705.htm> for one of the participating college of the FCCDLC's (Miami-Dade Community College) strategic technology plan;
- <http://www.indiana.edu/~ovpit/strategic/> for Indiana University's strategic technology plan;
- [http://www.mtsac.edu/~jchristi/it\\_splan.html](http://www.mtsac.edu/~jchristi/it_splan.html) for the Mt. San Antonio College's strategic technology plan;
- <http://www.murdoch.edu.au/itatmdu/stratplan/stratpan.htm> for Murdoch University's strategic technology plan;
- <http://www.uww.edu/TIR/itplan/itexec.htm> for the University of Wisconsin-Whitewater's strategic technology plan;
- [http://www.cisco.com/warp/public/cc/so/cuso/sms/tpez\\_pl.htm](http://www.cisco.com/warp/public/cc/so/cuso/sms/tpez_pl.htm) for guide to building a technology plan;
- <http://www3.open.ac.uk/search/bm/p1.dll?SEARCH> for the British Open University's (BOU's) strategic technology plan; and
- <http://www.athabascau.ca/html/info/sup/sup/htm> and <http://www.athabascau.ca/records/sup99-03.htm> for Athabasca University's strategic technology plan.

#### **Development of Manuals And Materials**

Manuals and all materials need to be developed prior to implementation. This is very important for the seamless operation of the whole system. Manuals refers to technical guidelines for both administrators and students about how to work and study within the new operational system. Manuals for administrators should include how to administer both the online and the off-line services. Manuals for students should as well elaborate how students can access and use both the online and off-line services. Most importantly, the manuals should tell the users "where to go" or "who should be contacted" in case of problems. Materials refer to the content that needs to be delivered through the system such as:

- course materials in both printed and non-printed forms;
- questionnaires/tests to assess student's readiness for distance learning;
- study guides; and
- examination items.

Development of manuals is probably best conducted through a project management approach. This approach works best when it is tied to resource allocation. It will involve all the resources including staff, facilities, and funding available in the institution and therefore ensure high-quality and cost-effective development. However, the project management approach is often viewed "...as a bureaucratic, expensive, and unnecessarily complicated

process, and a process that restricts the freedom and autonomy of the [individual] (Bates, 1998, p. 72)."

On the other hand, materials can be developed through either a lone ranger or a project management approach. A lone ranger approach will enable small grants to start the development, and to encourage faculty to start using new technologies as the grants become available. This will help faculty understand the potential of the technology and thus lead to innovative ideas about how to use the technology in a specific subject area. It will also support individual proposals in a bottom-up fashion and thus encourage individual creativity. Nevertheless, the lone ranger approach has often resulted in amateurism and even unfinished products (Bates, 1998). Therefore, it is extremely important to emphasize the standard of quality when this approach is used for development. Bates (1998) mentions four components of quality that need to be ensured in technology-based educational materials: content, media production, instructional design, and delivery and student support. Accordingly, even if the materials are developed through a lone ranger approach, the developer should be a team consisting of at least a content specialist, a media specialist, and a course designer. A person or a team acting as a technical "Help Desk" should also be made available to the team during the whole development process.

Supporting materials such as the self-assessment of distance learning readiness and study guide should be developed in accordance with the students' current situation. Self-assessment questionnaire usually consists of but is not restricted to items about learning style/habits/strategies, time management, and reading ability. However, there are examples of such materials from other distance learning institutions available in the WWW. As an illustration, all community colleges within the FCCDLC system include their self-assessments and study guides in their websites, which can be accessed through [http://www.distancelearn.org/consortnav/con\\_frame.htm](http://www.distancelearn.org/consortnav/con_frame.htm) (see Appendix 5 for hard copy of some examples).

Content of study guides can be divided into two areas: general study guides for learning at a distance and specific study guide for particular courses. Study guides for particular courses are usually part of the courses and developed by the course developers. General study guides on the other hand, are part of the general support services, and are best emphasized on enhancing students' independent learning ability. Studies have shown that it was not that students who failed faced any more hindering factors than did successful students, but rather they were not able to cope with them as effectively as were the latter. This suggests that it is extremely important to help students develop "coping strategies" with which to overcome the typical and common barriers faced by independent learners (Paul, 1998). The typical and common barriers for students within a particular context can be derived from the answers to the self-assessment (for distance learning readiness) completed by students themselves. In other words, these two services are aimed at developing independent learners relative to their

initial self-sufficiency, “ ... a notion that graduates should be more self-sufficient learners than they were at the point of entry (Paul, 1990, p. 83)”

### **Pilot Project**

There are at least two approaches to pilot project a new system. The first approach is to pilot project the whole system within a selected and limited area of coverage, and the second approach is to pilot project a selected element of the system for the whole area of coverage.

The first approach enables UT to select the area which already has the necessary infrastructure and facilities to support the new system. It will thus give UT the opportunity to see whether the new system works and is able to handle the overall daily operational activities in the selected areas. Accordingly, the findings of the pilot project will give comprehensive inputs for the revision of the whole system. With this approach, UT will be able to start implementing the new operational management system gradually, according to the readiness of individual ROs. Nevertheless, this approach may create non-technical problems such as inequality of services to students in other areas. In addition, as more advanced areas are usually located in Java, this will enhance the already existing Java and non-Java sentiments.

The second approach will ensure equality of services for all students. This approach will enable UT to improve the services in accordance with the availability of the infrastructure of the particular elements of the new system, as prioritized by the Strategic Technology Plan. However, since the pilot project only implements some parts of the new system, the inputs gathered will also be partial. In other words, the revision of the new system will become fragmented. There is a risk of then having a “never ending” revision process: revision of one part/element of the system may not be compatible with the development of the other remaining elements of the system.

The selection of pilot project approach should then be determined carefully. The positive and negative points of both approaches should be thoroughly identified and their implications be minimized. Despite the approach, necessary improvement of the new system should be made upon the completion of the pilot project. The pilot project should also result in recommendations for monitoring and continuous improvement process during the full implementation of the new operational management system.

## CONCLUSION

Universitas Terbuka (UT) is a nationwide institution offering distance learning opportunities to all Indonesians. The organization is highly controlled and managed by the HO located in Jakarta. Although UT has 31 ROs located throughout the country, management of daily activities is mostly centralized at the HO in Jakarta. Except for organizing face-to-face tutorials, the ROs do not have any authorization or equipment to plan and conduct other academic activities. Communication both within the HO and between the HO and the ROs rely mostly on conventional modes such as mail and face-to-face.

UT's learning materials are mainly print-based with some audio-video and computer-based materials. The use of computer networking including the Internet is still limited. The extensive use of computing is mostly for data processing such as for maintaining student records (the Computing Center) and scoring examination results (the Examination Center). Even though all units in the HO is connected to UT's Local Area Network (LAN), the HO has not yet electronically connected to the ROs. Only few ROs are already equipped with facilities to access the Internet .

UT faces many problems, especially those related to registration, learning support, and examination issues. The analysis has shown that those problems are by and large the result of:

- the lack of a fast reliable two-way communication channel/system between the HO and the ROs;
- the lack of a comprehensive data management system accessible to all staff in both the HO and the ROs; and
- the imbalance division of authorities and responsibilities between the HO and the ROs.

And this rather centralized operational management system has resulted in inefficient and inaccurate decisions and operational actions.

The examples of the consortia model of management systems have shown that a balance of centralized and decentralized systems for managing distance learning programs is effective and efficient. The examples and literature have also shown the ICT plays an important role in this kind of management system. Accordingly, the proposed management system is envisioned to be ICT-based and a mix of centralization and decentralization of mechanisms/procedures for registration, course development and delivery, learning support services, and examination. In other words, ICT will be utilized not to completely replace but rather to automate some of UT's operational processes in conjunction with the current conventional procedures. This proposed system is expected to enhance UT's responsiveness to student's demands at local areas through ROs, but at the same time to achieve the common goals of the whole institution.



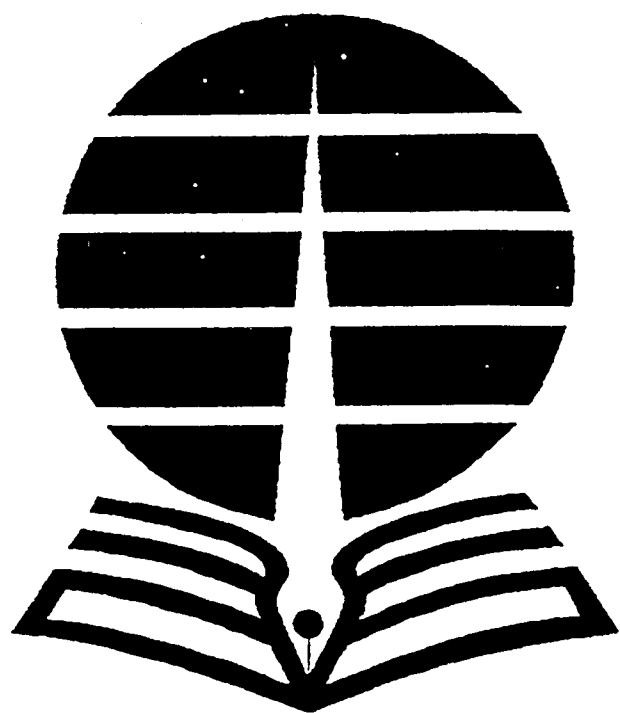
As it is difficult to gain acceptance of a new way of doing things, especially if the people are not involved in formulating the vision, it is recommended that the implementation is started with sharing the vision with key persons within the institution. To convince them about the importance of the new system, those key persons have to be provided with the rationale of why the new system should be developed in the first place. Once the vision is shared and everyone agrees with the stated common goals, it is also imperative to involve those key persons in translating the vision and the conceptual design of the new system into strategic plan as much as possible. The strategic "technology" plan should be developed carefully in accordance with the current stage of art of the institution; and the development of such a plan should involve people from across units within the university.

Several preparatory steps need to be done before UT fully implements the new proposed management system. This is important to ensure the seamless transition from the current operational processes to the new ones. The preparatory steps include the assessment of the existing infrastructure, the development and upgrade of the required infrastructure, the development of manuals and materials, and the conduct of a pilot project on a small scale basis.

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**APPENDIX 1**

**THE FLORIDA COMMUNITY COLLEGES DISTANCE LEARNING  
CONSORTIUM (FCCDLC) SYSTEM**

## THE FLORIDA COMMUNITY COLLEGE DISTANCE LEARNING CONSORTIUM (FCCDLC)

### Background

The Florida Community College Distance Learning Consortium (FCCDLC) was established in July 1996 by the State Board of Community Colleges (SBCC) within the Florida Community College System (FCCS). The FCCS plays an important role in Florida's postsecondary education system. The philosophy of the Department of Education (DOE) is that postsecondary education should be within a 30-minute commute of all Florida citizens and that the first two years should be affordable. The decision-makers at that time believed that creating a Florida Community College System would meet those two goals and increase access to postsecondary education. Within Florida's "2+2 System", community colleges serve as the primary access point to higher education for the majority of students in Florida. Through Florida's "Common Course Numbering System", it is ensured that courses with the same prefix and identifying numbers at community colleges and state universities include the same curriculum content, and therefore their credits are transferable.

Today there are 28 community colleges consisting of 28 main campuses, 25 additional branch campuses, 19 centers, 38 special purpose centers, and 14 joint-use facilities for a total of 124 sites (FCCDLC, 2000). Data show that over 70% of the students in the upper-division (junior and senior years) of state universities began their higher education in a Florida public community college, and that 47% of all the graduates of the State University System (SUS) began their studies at a community college (Furlong, 2001)<sup>1</sup>. The names of the 28 community colleges and their student body are listed in Table 1-1.

Table 1-1. Names and Student Body of FCCDLC's Community Colleges

Community Colleges	Number of FTE Students	Community Colleges	Number of FTE Students
Brevard	8,175	Miami-Dade	29,583
Broward	12,794	Tallahassee	5,881
Central Florida	1,174	North Florida	914
Chipola Junior	1,245	Okaloosa-Walton	3,527
Daytona Beach	9,979	Palm Beach	8,700
Edison CC	4,340	St. Petersburg	9,300
FL CC at Jacksonville	15,323	Valencia	13,745
Florida Keys	691	Pasco-Hernando	5,707
Gulf Coast	4,171	Pensacola Jr	7,897
Hillsborough	8,700	Polk	2,859
Indian River	9,100	Santa Fe	3,232
Lake City	1,582	Seminole	6,756
Lake-Sumter	1,187	South Florida	2,404
Manatee	3,700	St. Johns River	4,473

<sup>1</sup> Tom Furlong, Deputy Director of SBCC, personal communication.

Distance learning in community colleges began in the mid 1970's when a few community colleges began offering telecourses. The first Internet course and program was developed and delivered in 1994 by St. Petersburg Junior College for their Veterinary Technology program. By Fall 2000, through collaborative efforts of the FCCDLC, the number of unique Internet courses listed has grown to 592, a 600 number increases from 1994 (FCCDLC, 2000). Besides the telecourses and the Internet-based courses, one of the college (Lake City Community College) was the first to set up an interactive compressed video network for the delivery of distance learning courses in 1995. Today, with the support of video-conferencing equipment, every Florida community college has the capability to interact with all other colleges via the Florida Video Network (FCCDLC, 2000).

**The Structure, Memberships, and Missions**

The FCCDLC is an advisory committee of the State Board of Community Colleges. The SBCC appoints the membership of the Consortium with the Chair of the State Board appointing the Chair of the Consortium who shall appoint any necessary committees. The Consortium is administratively assigned to the Division of Community Colleges and its support staff are located on the campus of Florida State University, Tallahassee (see Figure 1-1 which pictures the relationships between FCCDLC and the community colleges within the FCCS and the SBCC of the Department of Education (DOE).

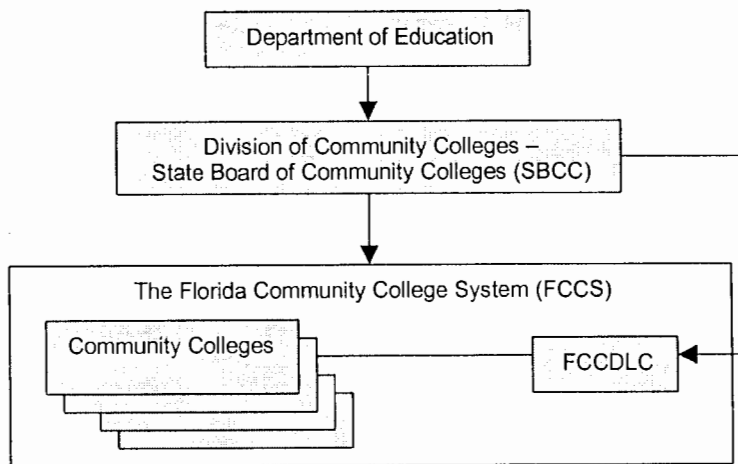


Figure 1-1. Relationships Between the FCCDLC and the Community Colleges

The Consortium is made up of 32 members: one representative from each of the 28 community colleges, two representatives from the Council of Presidents and two members of the SBCC. Figure 1-2 shows the internal organizational structure of the FCCDLC.

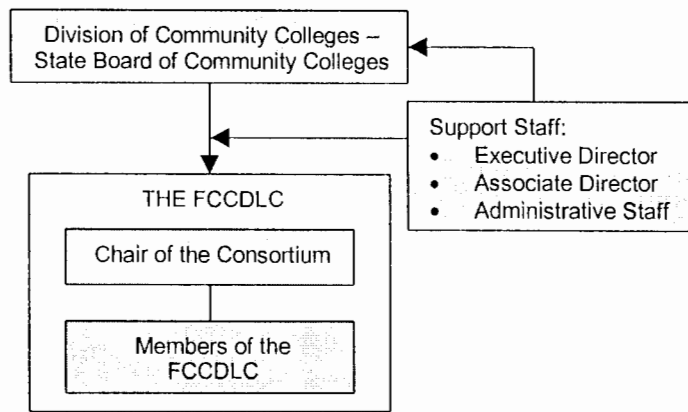


Figure 1-2. Organizational Structure of the FCCDLC

**The purpose of the FCCDLC is to provide coordination among Florida's 28 community colleges in the development, delivery, marketing, and acquisition of distance learning instruction and its infrastructure.** The Consortium is supposed to coordinate the establishment of a technology-enhanced community college delivery system that supports the mission of the community colleges and ensures maximum access to higher education for all Florida residents by utilizing instructional technology and eliminating the barriers of distance, time, and place. Therefore, the Consortium is directed to address issues relating to:

- access,
- time needed for students to meet their educational goals,
- coordination of the acquisition, development and distribution of courses,
- an inventory of distance learning courses, staff development materials and support services,
- training efforts for faculty and staff and related services involved in distance learning.
- developing a distance learning associate to Baccalaureate degree program with the State University System.

The consortium members meet quarterly to discuss and address the above issues.

### **Programs and Services**

The Consortium facilitates distance learning statewide by recommending policies, funding recommendations, licensing products and services, maintaining a website and electronic catalog of distance learning courses, staffing consortium committees, representing the FCCS on regional and national committees and facilitating the sharing of information and resources across the system. As an example, the Consortium has obtained funding from the Legislature for installing at least one DS-3 circuit for Internet connection in each college. Colleges wished to have more than one circuit may add on their own budget.<sup>2</sup>

<sup>2</sup> John Opper, Executive Director of the FCCDLC, personal communication.



With regard to content issues, the consortium has recently received \$1,000,000 from the legislature to license courses for community colleges. Today the consortium has licensed hundreds of online courses (from three vendors, i.e. Element K, Course Technology, and NETG) and hundreds of telecourses, which can be either broadcast or sent to students in the form of video tapes. The licensing of the online courses were focused courses that change very rapidly such as those of IT courseware for workforce.<sup>3</sup> It is more efficient to license from the available vendors, which offer products that will prepare students to take international standardized test for certification (e.g. from Microsoft, CISCO, etc.). The telecourses are licensed from several vendors including PBS, Magna System, Inc., Intelcom, Dallas County Community College System, Coastline Community College, and Quisic & Harcourt Brace. All those online courses and telecourses are available to and can be unreservedly (i.e. per license agreement and space available) used by the colleges according to their intentions. They may offer the courses as distance learning materials or integrate them into the classroom teaching.

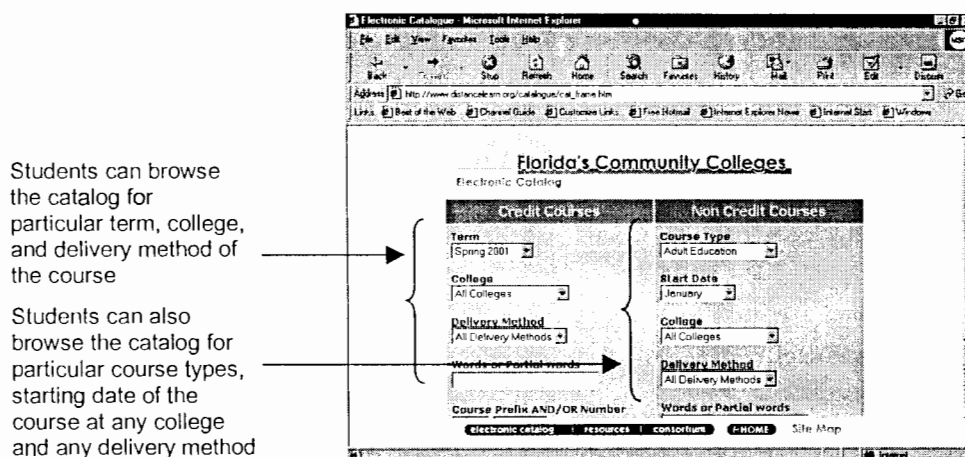


Figure 1-3. Searching Facility on the Online Catalog of the FCCDLC

The consortium created a comprehensive website in 1997. The website includes the first distance learning catalog ([http://www.distancelearn.org/consortnav/con\\_frame1.htm](http://www.distancelearn.org/consortnav/con_frame1.htm)) for community colleges. As shown by Figure 1-3, the website provides access for students or prospective students to search the online catalog by term, college, and course number or prefix. The website also provides links for students to any desired community college distance learning programs (websites). The links to community colleges' distance learning websites will directly take students to individual college's online services (see Figure 1-4).

<sup>3</sup> Susie Henderson, Associate Executive Director of the FCCDLC, personal communication.

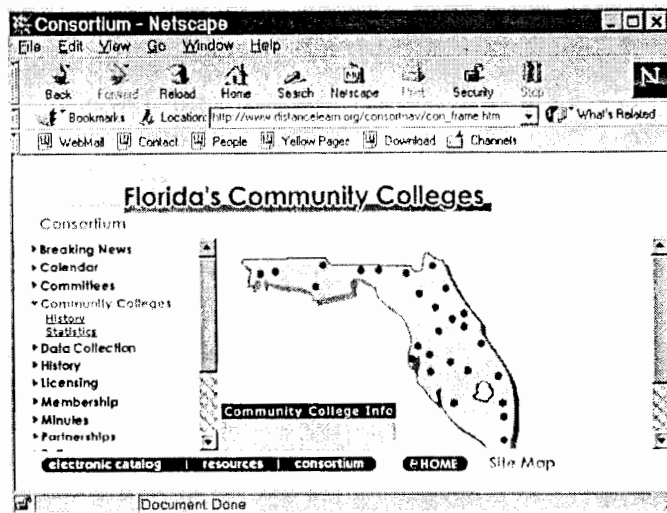


Figure 1-4. Linkages to the Community College Websites

As shown in Figure 1-4, the dots are “click able” and will take students directly to particular community college distance learning website. For example, if a student make a “click” on the Tallahassee Community College, s/he will find the screen presented in Figure 1-5.

The websites of individual community college are developed and maintained by the colleges, not by the FCCDLC. Therefore, every college will have different format and online services available. However, all websites provide access for students to do online consultation, application, and to seek online learning-related supports (this will be discussed further in the later part). Therefore, it is important to note that although the FCCDLC provides access to students for distance learning opportunities, it does not process the actual academic and administrative academic activities. Once students enter the individual community colleges’ websites, they are directly communicating with the respective colleges.

The consortium’s website also provides students with access to the Community College Library Automation (CCLA), which provides an online library information network for community colleges (LINCC). The LINCC (known as LINCCWeb at <http://www.ccla.lib.fl.us/>) provides access for the students, faculty, and staff of community colleges of Florida to over 70 full- and partial-text databases covering a variety of academic concentrations. Other distance learning resource access includes:

- **The Distance Learning Library Initiative** (<http://dlis.dos.state.fl.us/dli/index.html>)  
This is a cooperative project between the Community College System, the State University System, and the State Public Library System for the purpose of building an electronic library to support the emerging distance learning programs in Florida's higher education community.

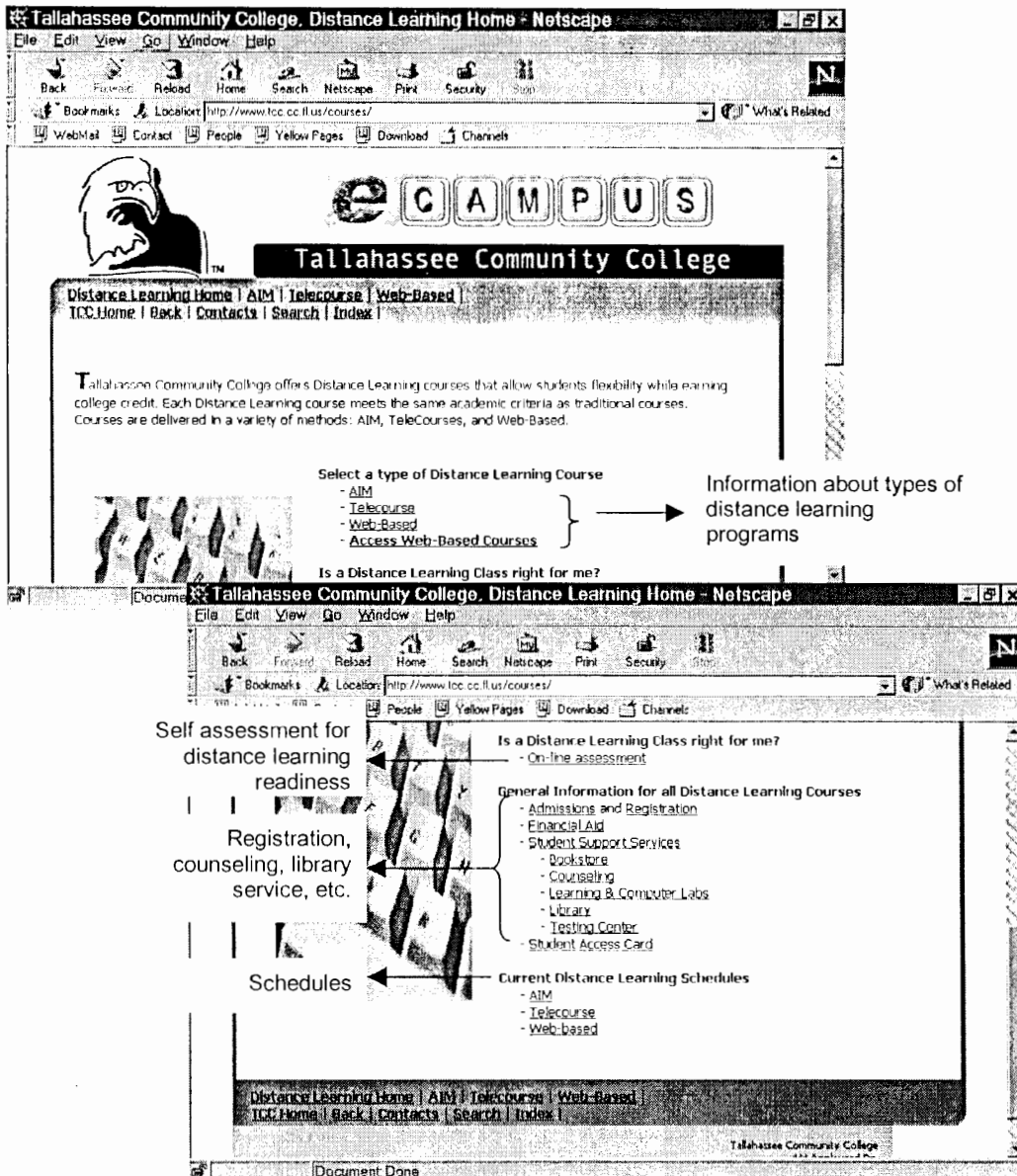


Figure 1-5. The Tallahassee Community College (TCC) Distance Learning Website

→ **Educating Everyone** <http://www.educatinge.org/>)

This is a Florida-based not-for-profit foundation whose mission is to help distribute information, technology, services, and capital in order to promote the cause of distance learning in order to assist instructors, students, educational programmers, colleges, virtual universities and transmission providers to reap the maximum benefits distance learning can provide.

→ **Florida Academic Counseling and Tracking System** <http://www.facts.org/>)

This is a comprehensive higher education network that provides access to the computing resources of Florida's higher education institutions. FACTS offers a variety of student services and resources, provided for the convenience of users by the State of Florida and by the participating institutions. The administrative site for FACTS is located at <http://www.facts.org/admin/> which includes documentation regarding the development phase of this innovative technology application.

- **Florida Distance Learning Network** (<http://www.firn.edu/fdln/>)  
The Florida Distance Learning Network seeks to improve student learning and achievement through new instructional techniques and strategies which increase access to distance learning in the most cost-effective ways.
- **The Florida High School** (<http://fhs.net/>)  
The Florida High School provides on-line educational opportunities for grades 9-12.
- **Florida Distance Learning Reference & Referral Center** (<http://www.rrc.usf.edu/>)  
Provides centralized reference and referral services to students enrolled in off-campus courses offered by the State of Florida's public universities and community colleges. To view a presentation about the center, click [here](#).
- **Florida Virtual Campus** (<http://www.floridavirtualcampus.org/>)  
This site provides a database of both State University and Community College distance learning courses and programs. The original site, Florida's Campus, along with archival documents and reports, can be accessed at: <http://www.flcampus.org>.
- **Community College Teaching, Learning, and Technology (CCTLT )** (<http://inst.santafe.cc.fl.us/~revans/cctl/index.htm>)  
This is an online interdisciplinary publication focused on current issues in community college education. The publication is designed to foster peer collaboration and ongoing discussion of teaching and learning in an increasingly technological age.

### **Management of Distance Learning Programs and Courses**

The FCCDLC is not responsible for managing the planning and operations of distance learning programs offered by the community colleges. Each college has their own strategic and management plan for distance learning. Those patterns are based on historical development of the program and philosophy of the college regarding distance learning (SBCC, 2000). A study conducted by SBCC shows that it was evident that in some colleges, distance learning had developed as a "special project" and was organizationally separated from the general academic affairs. However, it has also become clear that a distance learning program functions more effectively when it ties to the general academic program (SBCC, 2000).

Since community colleges are dual mode institutions in which face-to-face instruction is still the majority, distance learning courses are usually developed and managed collaboratively by several existing academic departments and learning resource centers coordinated by a special committee or unit . As an illustration, at the Tallahassee Community College (TCC), the distance learning programs are coordinated by the Assistant Vice President for Instruction (TCC, 2000), who reports to the Vice President for Educational Services (see Figure 1-6).

The structure shows that there is no office that is solely responsible for distance learning activities at TCC. That is because the administration and maintenance of a quality distance learning program crosses many units of the College. As shown by Figure 1-6, the day-to-day administration of the distance education program at TCC is a joint responsibility shared by a Faculty Coordinator, Library Services, the Academic Computing Director, and the Academic Division Directors. The Faculty Coordinator is responsible for coordinating activities relating to academic issues, faculty, and student services. The Academic Computing Director is responsible for the coordination of training activities, and for issues relating to technology.

Library Services is responsible for licensing and broadcasting of televised instruction, and scheduling the Interactive classroom. The Academic Division Directors are responsible for scheduling classes, printing guidebooks, and other administrative duties at the division level that relate to distance learning activities. The ultimate responsibility for Distance Learning, as with all academic programs at TCC, resides with the Vice President for Educational Services.

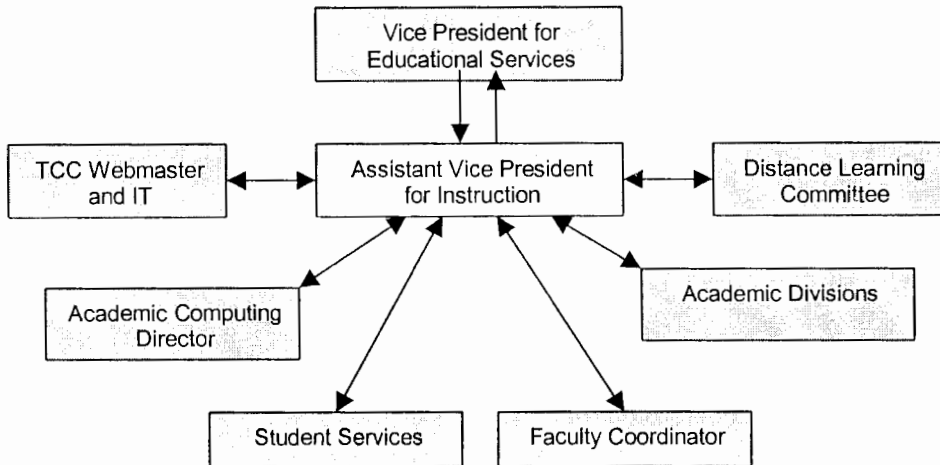


Figure 1-6. Managerial Structure of TCC Distance Learning

Under this structure, the academic divisions are granted as much autonomy as possible in determining which courses should be developed, and/or adapted, for delivery via a distance. Oversight of Distance Learning devolves to the Distance Learning Committee, which is comprised of faculty from each academic division, one academic Division Director, the Directors of Extended Studies and Academic Computing, and representatives from Student Services and/or Counseling, Information Technology, and the Library. The Distance Learning Committee is chaired by the Assistant Vice President for Instruction.

This management model applied at TCC is a representative of that of other community colleges within the FCCS. The differences that may be found in the names of the units involved, and in the coordinating agent at the top executive level. The composition of units, however, is almost the same involving those responsible for academic matters, technology, learning supports, and library. Units such as the Academic Computing, Information Technology, or Technology Support Center are found in every college's system because of the trend for offering online courses.

The role of the FCCDLC in management of distance learning program is to enhance the collaboration and resource sharing among the colleges. Management issues that would involve the FCCDLC are those related to statewide policies regarding physical infrastructure, human resource development, course licensing, and finance. As previously discussed, the

Consortium has successfully installed at least one DS-3 circuit through the Florida Information Resource Network (FIRN) for Internet connection POP in each college. With this, not only the bandwidth is increased but the communication will also be secured within a closed circuit system of the FIRN. The consortium has also licensed hundreds number of online courseware and telecourses and made them available to all community. With these infrastructure, every college will have the opportunity to offer more distance learning courses. This is in line with the Consortium mandate, which is to coordinate the establishment of a technology-enhanced community college delivery system that ensures maximum access to higher education for all Florida residents by utilizing instructional technology and eliminating the barriers of distance, time, and place.

### Registration System

Registration in community college distance learning programs has to be done directly at the colleges. The FCCDLC is not responsible to address nor process any registration inquiries. Students, even if they access an online courses through the FCCDLC online portal, have to follow registration procedures set by the colleges. Each college has different alternative methods for student registration. For example, TCC allows students to register by telephone (through its Eagle Line), mail, or in person. As shown by Table 1-2, the majority of colleges allow students to register online. Once enrolled, students may access their records including their grades and financial status electronically. Tuition and fees can be paid by mail or online at several colleges using credit cards (for example at Seminole and Brevard Community Colleges). It is also important to note that every student is provided with a personal e-mail account.

Table 1-2. Registration System of the Florida Community Colleges

Community College	Registration System			
	In-person	Mail/Fax	Telephone	Online
Pensacola Junior	✓	✓	✓	
Okaloosa Walton	✓	✓	✓	✓
Gulf Coast	✓	✓		
Chipola Junior	✓	✓		
Tallahassee	✓	✓	✓	✓
North Florida	✓	✓		✓
Lake City	✓	✓	✓	
CC at Jacksonville	✓	✓		✓
Santa Fe	✓	✓	✓	✓
St. John River	✓	✓		
Central Florida	✓	✓	✓	
Daytona Beach	✓	✓		✓*
Seminole	✓	✓	✓	✓
Valencia	✓	✓	✓	
Lake Sumter	✓	✓		
Brevard	✓	✓	✓	✓
Pasco Hernando	✓	✓		
St. Petersburg	✓	✓	✓	✓
Hillsborough	✓	✓	✓	
Manatee	✓	✓		✓*
Polk	✓	✓		
South Florida	✓	✓	✓	

Community College	Registration System			
	In-person	Mail/Fax	Telephone	Online
Indian River	✓	✓	✓	✓
Edison	✓	✓		
Palm Beach	✓	✓	✓	✓
Broward	✓	✓	✓	✓
Miami-Dade	✓	✓	✓	✓
Florida Keys				

\*will have it starting the Fall of 2001

### Course Development, Media, and Delivery Method

As indicated by the organizational structure of the day-to-day management, distance learning courses are developed collaboratively by the faculty and the other supporting units. As at TCC context, the decision for course selection is the responsibility of the faculty in conjunction with the Division Director. However, if it is necessary to develop a particular course or program in response to institutional or community needs, the Assistant Vice President for Instruction may contact the appropriate Division Director who then would initiate the process. Each division has to submit a prioritized list of requests for development or revision of the course. The distance Learning Committee would examine the proposal in terms of the educational fit within the institution, in relation to the mission and goals of the program, and in relation to the missions and goals of the College (TCC, 2000). Selected proposals will be forwarded for funding to the Vice President for Educational Services.

With regard to media, colleges employ different instructional media or delivery methods. In general, there are five types of instructional media used by the Florida community colleges. They are:

1. **Internet:** Courses delivered through the Internet are known as online, web-based, or Internet-based courses. Course information, instruction, interaction, and assignments transferred over the Internet in real time or asynchronously. Additional print-based materials may be required.
2. **Two-way TV:** Sometimes termed as video-conference, interactive classrooms, telecourses, and compressed video. The learner and instructor are at designated remote TV sites where real time interaction takes place. It is similar to a traditional classroom.
3. **Print-based:** Courses delivered on print-based are sometimes termed as text-based, or correspondence courses. Course content is mainly delivered via print although it may involve communication via e-mail or telephone.
4. **Video:** Courses in the form of video programs may be offered as telecourses, broadcast TV, or "course in a box" materials. Course content delivered on pre-recorded video tapes. Videos may be viewed on local TV, checked out of the library, or purchased at bookstores. Additional reading may be required.
5. **Multi Media:** Courses delivered through combination of printed, audio, as well as video-based materials.

The types of instructional media used by each college is shown in Table 1-3. It is important to note that although only five colleges offer print-based or correspondence type of distance learning courses, almost all other courses are accompanied by the use of text books for required reading.

Table 1-3. Instructional Media Used By Florida Community Colleges

Community College	Instructional Media*			
	Print	ITV	Video/TV	Online
Pensacola Junior	✓	✓	✓	✓
Okaloosa Walton	✓	✓	✓	✓
Gulf Coast			✓	✓
Chipola Junior				
Tallahassee	✓		✓	✓
North Florida				✓
Lake City		✓	✓	✓
CC at Jacksonville		✓	✓	✓
Santa Fe		✓	✓	✓
St. John River	✓		✓	✓
Central Florida		✓	✓	✓
Daytona Beach		✓	✓	✓
Seminole			✓	✓
Valencia		✓	✓	✓
Lake Sumter		✓	✓	✓
Brevard		✓	✓	✓
Pasco Hernando		✓	✓	✓
St. Petersburg				✓
Hillsborough		✓	✓	✓
Manatee		✓	✓	✓
Polk			✓	✓
South Florida	✓	✓	✓	✓
Indian River		✓	✓	✓
Edison		✓	✓	✓
Palm Beach		✓	✓	✓
Broward		✓	✓	✓
Miami-Dade	✓	✓		✓
Florida Keys				

- \* Print: print-based courses, text-based courses, correspondence courses
- ITV : video conference, interactive classrooms, compressed video, 2-way TV
- Video: telecourses, broadcast TV, course in a box
- Online : web-based courses, internet-based courses

Course materials are usually developed using a team approach involving a course manager, a course designer, a content specialist (usually the instructor), and a media specialist. Textbooks and other materials used for the courses can usually be handled through the College web sit, Academic Resource link, or through on-campus bookstore.

**The FCCDLC assists community colleges' course development by providing both instructional technology and training needed for online course development.** Through its collaboration with the Florida Virtual Campus (FVC), the consortium has provided the colleges with online learning management tools of WebCT and Blackboard, which include **training for faculty members and staff of the community colleges. This statewide licensing of learning management tools has saved the colleges' budget up to US\$10,000 per term of use (usually per semester) per college.**



## Learning Support System

Learning support for students is provided both by individual community colleges and by other resources available in Florida. Every community college provides learning supports for both on campus and off campus students. Learning supports (online and off line) usually include self-assessment for distance learning readiness, counseling, and library services. And, as every students in community colleges are provided with an e-mail account, online learning support services are therefore accessible to all students. As an example, the TCC online distance learning website also provides students with skill self assessment for distance learning readiness, admissions, registration, records maintenance, academic advising, counseling, library services, and scheduling (see Figure 1-5). All students are encouraged to visit faculty member's office in a variety of ways during office hours. Faculty teaching Web-based courses conduct virtual office hours through the use of Achat@. In addition, discussion boards, telephone and e-mail are common forms of communication. Through Achat@, telephone and e-mail, ideas are exchanged, questions are addressed, and one-to-one and small tutoring take place (TCC, 2000).

The State of Florida facilitates students' distance learning process by providing access to statewide online resources. Resources for library services through the DLLI, for academic counseling and tracking for students through the FACTS, and for information on other distance learning institutions through the FVC have been especially appreciated by students (SBCC, 2000).

- **The Distance Learning Library Initiative** (<http://dlis.dos.state.fl.us/dlli/>)

The Distance Learning Library Initiative (DLLI) is the library component of the emerging distance education programs in higher education in Florida. It is a cooperative effort of Florida's public state universities (FCLA or LUISWeb) and community colleges (CCLA or LinCC), as well as public libraries through the State Library of Florida. The Florida Institute on Public Postsecondary Distance Learning oversees the Initiative, with implementation delegated to a Steering Committee. The DLLI program components are as follows:

- Electronic Resources.  
Access to a comprehensive array of information in all fields of study, including full-text, through OCLC's First Search and Britannica Online. (Authorization required.)
- Reference and Referral Center.  
A help desk and 800-number on-call reference librarian, available to students and staff from any participating library in the state. The University of South Florida Libraries hosts this center.
- Library User Training.  
The Reference and Referral Center hosts a website that address the needs of both librarians and students in navigating the statewide distance learning network and the worldwide Internet to conduct research and information-gathering in support of their individual education programs.

- Document Delivery.  
A statewide courier service provides inter-library delivery among the nearly 300 libraries in the Florida Library Information Network.
- Borrowing Privileges.  
Students in any of Florida's 38 public postsecondary institutions may freely borrow materials at any of the other libraries.

- **The Florida Academic Counseling and Tracking for Students (<http://www.facts.org>)**

The Florida Academic Counseling and Tracking for Students (FACTS) is a comprehensive higher education network that provides access to the computing resources of Florida's higher education institutions. FACTS offers a variety of student services and resources, provided for the convenience of users by the State of Florida and by the participating institutions. FACTS is designed website provide the following services.

- Academic Advising & Transcripts (<http://www.facts.org/cgi-bin/nirvana>)  
Students can get (unofficial) transcript, run a degree audit , and "Shop" for degree programs at other institutions
- Admissions (<http://www.facts.org/cgi-bin/nirvana>)  
Students can submit an electronic application for admission to designated institutions using a common application form process, apply online to Florida institutions, and connect to institutional admissions sites.
- Records & Registration (<http://www.facts.org/cgi-bin/nirvana>)  
Students can register for classes, access college catalogs and class schedules, perform drop/add, submit a transient student form, and connect to institutional registration sites.
- Fees & Payments (<http://www.facts.org/cgi-bin/nirvana>)  
Students can see what they owe in detail, look at fee payment options, make electronic payments, and connect to institutional fee information sites.
- Financial Aid (<http://www.facts.org/cgi-bin/nirvana>)  
Students can access the federal and state financial aid sites, complete and submit the FAFSA application form, research scholarship programs and loan payment information, and connect to institutional financial aid sites.
- Institutional and Degree Program Information (<http://www.facts.org/cgi-bin/nirvana>)  
Students can search degree programs by institution, program, or degree to help you decide where to study and connect to institutional home pages.
- Distance Learning (<http://www.facts.org/cgi-bin/nirvana>)  
Students can search for all Florida distance education courses, learn about the innovative distance learning initiatives in Florida including the Florida Virtual Campus, and connect to institutional distance learning sites.
- Career Resources (<http://www.facts.org/cgi-bin/nirvana>)  
Students can use on-line career guidance systems, investigate degree programs as they relate to career options, and connect to institutional career resources sites.
- Library Services (<http://www.facts.org/cgi-bin/nirvana>)  
Students will be connected to all Community College and State University Library systems, state libraries and other research sources.

The Academic Advising and Transcript facility is especially beneficial for students. It allows students to search programs, get unofficial transcripts, degree audit, and shop for degree programs both in students' own institution and in other institution of their interests. The degree audit facility assist students to analyze whether their earned credits (at any college or university) have met the desired degree requirement (in the same or different

college or university that the students' are currently enrolled). If not, the system will list other courses to take (with their credit units) to complete the program. This facility also allows prospective students to view academic requirements to get a degree in any field of study from any post secondary education institutions in Florida. Appendix 4 shows how a prospective student can request for a degree audit and its results.

FACTS is now in its fourth year of operation and has not yet fully implemented all the online services. Services such as online application, payment, occupation labor and job information, portfolio information (matching a degree program to occupation), and viewing an individual student's financial aid eligibility and current financial aid status, and viewing an individual student's financial aid eligibility and current financial aid status, are not yet available. These services are to be completed and be made available to students in the year of 2002 and 2003.

- **Florida Virtual Campus** (<http://www.floridavirtualcampus.org>)

In July 1996, the State University System (SUS) and the Community College System of Florida (FCCS) jointly created a Distance Learning Institute for the purpose of encouraging and facilitating the cooperative development and delivery of distance learning instruction by Florida's public colleges and universities. In the fall of 1998, at the request of the University and Community College systems, the Institute board created the Virtual Institution Design Team to recommend a structure for a "virtual university." On July 1, 1999, the new Florida Virtual Campus (FVC) was established. Its mission is to assist Florida post secondary institutions in providing affordable access to quality learning opportunities and services by creating a cooperative atmosphere that will lead to a seamless distance learning experience for students.

The FVC is not a separately accredited degree-granting institution, but rather a state portal to the distance learning opportunities at Florida's public and private community colleges and universities. The FVC negotiated a reduced-cost statewide leasing of web-course development tools, WebCT and Web Course in a Box, and conducted faculty training in the use of those tools. For the 2000-2001 academic year, the FVC has licensed Blackboard Course Manager 5, WebCT Version 3.0 and Merlot for all public and private institutions in the state when a nominal co-payment is paid to the vendor. The FVC is co-located at the University of South Florida with DLLI and FACTS.

The online services provided by FVC can be accessed through its web site (<http://www.floridavirtualcampus.org>). It is through this web site, students (both on campus and off campus students) and anyone who is interested in finding out about distance leaning opportunities in Florida can access the entire available resources. However, as previously mentioned, the FVC itself will not grant any certification to the

students. Students will instead be directed and linked to the individual institution of their choice for registration as is in the FCCDLC's system.

The above three online services provided by DLLI, FACTS, and FVC may have similar supports offered by the individual community colleges and the FCCDLC itself. However, these web sites combined with other web sites such as that of the State University System (SUS) library automation (FCLA with its LuisWeb) have definitely strengthened the learning support infrastructure of the Florida distance learning system. Ultimately, these support services facilitate and assist up distance learning students in their learning process. As for community college students, FACTS would help them to explore career and to maximize transferable their community college courses to universities. As shown by Appendix 4, the FACTS system would standardize any college/university transcript so that it would be transferable to the destined institution for credit transfer evaluation.

### **Learning Assessment**

As registration and the provision of learning supports, student learning assessment is also the responsibility of each community college, which usually is completely delegated to course instructors. All distance learning courses offered by all colleges involve self-tests or taken home assignments and sit-in examination at the end of the semester. Regardless of the media, each course usually requires completion of 3-5 assignments and 1 final examination. The assignments are various including book (reading) report, paper critic, objective test, essay test, a project, or writing a paper/article. At the end of the term, grades are sent to the students' permanent address, and transcripts are available through the normal request procedures. Unofficial transcript can also be obtained through the Florida Academic Counseling and Tracking for Students (FACTS).

To ensure quality and consistency, many distance learning courses have common exit exams. At TCC, for example, it is imperative that students are exposed to the same material regardless of the delivery mode (on-campus or distance learning). Each college also has its own Testing Center. Out of district students of one community college usually take the examination at their local college's Testing Center. For example, if TCC's distance learning program has one student who live in Miami, s/he may take the examination at the Miami-Dade Community College's (MDCC) Testing Center. TCC will appoint a Proctor (a supervisor) at MDCC to which the examination items would be sent. The completed examination will be packaged and sent back to the TCC by the Proctor. In some cases where it is not possible for a student to go to a community college, the Proctor may be selected (may also be suggested by students but appointed by the college) from a state or public library staff.

### **Summary**

The relationships between FCCDLC and the community colleges with all other institutions in providing access to distance learning programs in Florida can be depicted as Figure 1-7. As shown by the figure, distance learning resources are all linked together and made available to

every resident of Florida. Although there are some overlapping efforts made by the institutions and initiatives, this has enabled each online resource to be accessed from different portals.

Four essential elements facilitate the seamless distance learning programs in Florida community colleges. They are the statewide availability of:

1. distance learning courses offered by different institutions;
2. integrated library services; and
3. an academic counseling and tracking for student network; and
4. a solid electronic infrastructure, which enables students to have affordable and convenient, accesses to the Internet.

The distance learning courses, which include print-based, video-based, and Internet-based, are initially developed by individual colleges and universities. Today the collection has been significantly increased by nationwide licensed courseware (Internet-based) purchased through FCCDLC. Once these IT courses (which are non-credit) are incorporated into the colleges' course offering, it will increase the choices of higher education courses at a distance.

The library network has further accelerated the easiness of taking courses at a distance. This library network, which can be accessed through many different portals (web sites), allows students to look for and borrow books from their closest library (i.e. the library of a college or a university, a state library, or a public library). The DLLI's courier services to book borrowers across the state that provides overnight delivery to and from over 416 public and academic library locations in Florida have been very successful and well appreciated by the students (SBCC, 2000).

The online academic counseling and tracking for students (FACTS) assists any students or prospective students to look for an institution, a career choice, a program, and even for the possibility of transferring their credit courses from one institution to another. Nevertheless, none of the above mentioned online facilities would benefit the students if the Internet access is not affordable. Thus, the availability of statewide telephone infrastructure is very important. The Florida telephone system applies flat rate system for local calls, and this has made connection to the Internet affordable and comfortable for every student and most of Florida citizens. These all initiatives and resources "have put Florida colleges well ahead of many other states in the United States with regard to distance learning services" (SBCC, 2000, p. 20).

Finally, it is clear to note that the management of distance learning system in Florida is both centralized and decentralized. At the Consortium level, day-to-day management activities are highly decentralized at individual colleges. The Consortium serves as a facilitator and a mediator among colleges and between the colleges and the SBCC to address statewide issues regarding policies, infrastructure, and technology advancement. Within each college,

however, the management style is rather centralized with a coordinating agent at a very high hierarchical level (such as the Vice President for Educational Services or Academic Affairs). This seems to be effective for the resource sharing and cohesiveness purposes.

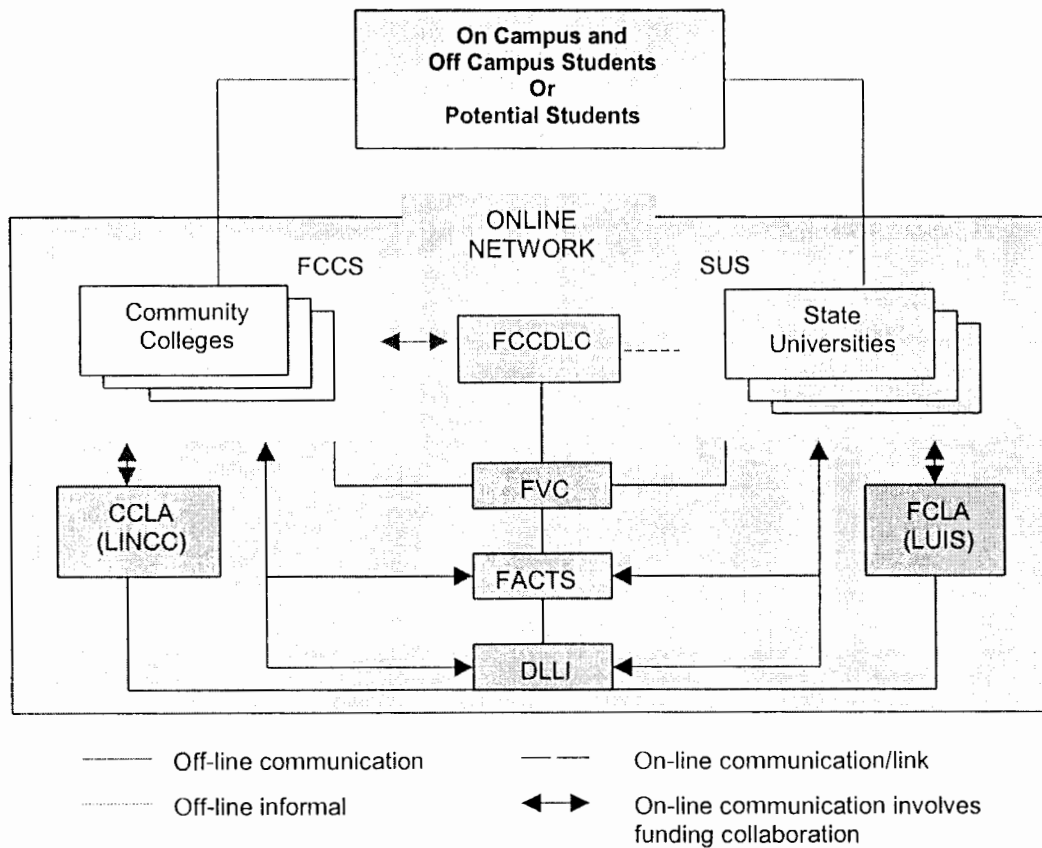


Figure 1-7. Florida Distance Learning Resources Network

## APPENDIX 2

### Student Body of UT by Regional Offices (Year 2000)

Regional Offices	Number of Students
Aceh	6,268
Medan	15,295
Padang	8,367
Pekanbaru	9,797
Jambi	6,688
Bengkulu	3,377
Palembang	12,920
Bandar Lampung	10,448
Jakarta	38,774
Bogor	17,240
Bandung	31,427
Semarang	18,952
Purwokerto	7,433
Surakarta	6,755
Yogyakarta	7,404
Surabaya	13,254
Jember	3,665
Malang	7,090
Pontianak	7,799
Banjarmasin	6,016
Palangkaraya	5,083
Samarinda	4,975
Manado	5,666
Palu	5,584
Kendari	4,656
Makassar	12,146
Denpasar	5,850
Mataram	5,662
Kupang	6,744
Ambon	5,336
Jayapura	6,009
Other Countries*	1,814
Total	308,494

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Bogor	17,240
Bandung	31,427
Semarang	18,952
Purwokerto	7,433
Surakarta	6,755
Yogyakarta	7,404
Surabaya	13,254
Jember	3,665
Malang	7,090
Pontianak	7,799
Banjarmasin	6,016
Palangkaraya	5,083
Samarinda	4,975
Manado	5,666
Palu	5,584
Kendari	4,656
Makassar	12,146
Denpasar	5,850
Mataram	5,662
Kupang	6,744
Ambon	5,336
Jayapura	6,009
Other Countries*	1,814
<b>Total</b>	<b>308,494</b>



## APPENDIX 3

### Technology Infrastructure of the Seminole Community College (two campuses)

- **Network:**

At the Sanford/Lake Mary campus the network is built with Asynchronous Transfer Mode (ATM) technology. The backbone runs over fiber optic to every building at OC 12 (655mbps) and OC 3 (155mbps) speeds. Approximately 70% of the network is completed with CISCO ATM hardware, delivering switched 10mbps and 100mbps speeds to the desktop. The remainder 30% of the network access is accomplished with CISCO 10/100 switches.

At the Oviedo campus, the network is built with gigabit technology. One hundred percent (100%) of the network is completed with CISCO gigabit hardware delivering 100mbps speeds to the desktop.
- **Servers:**

All servers are a combination of Rack-Mount Compaq Proliant 2500, 6500, 5000, 1500 and 1850s and DELL Computer 2450, 6500, 6300, and 2300. The servers at Sanford/Lake Mary and Hunt club are all ATM attached to the network using Fore Systems NICS and connecting at OC3 speeds. The servers at Oviedo are connecting at gigabit speed. The main operating system for instructional and administrative server support is Novell Netware 4.X. In addition, the College has installed Microsoft's NT 4.0 and Windows 2000 in some servers to support Client/Server dedicated applications for both instructional and administrative support, including online Distance Learning. Most WEB applications are running under NT 4.0 and Windows 2000.
- **Desktop:**

Working with all the other Community Colleges in the State of Florida. Seminole Community College has adapted a technology refresh program to replace its existing desktop hardware at least once every three years. Currently, the number of computer desktops in all campuses is over 700 with Pentium (300MHz or higher), and are running Microsoft Windows 98 OS with Office 97/2000 Suite applications, Microsoft Project 97/2000, McAfee's Anti-virus, Planbuilder and Novell's GroupWise 5.5.
- **Mainframe:**

As part of the WEB design of online registration and other administrative services developments, a new UNISYS ClearPath system was purchased and installed for both the production and development of the mainframe-based software. The storage available to this system is 144GB which is divided 50/50 for production and development.
- **GroupWare System**

The College uses Novell's GroupWise for e-mail, Calendar, Task and other GroupWare functions. It has been implemented as a standard application and it is supported with three dedicated DELL servers for Intranet and Internet based E-mail.

(Further information can be seen at URL <http://scc-fl.com/DL>)

## APPENDIX 4

### AN EXAMPLE OF RFP

INTERNATIONAL COALITION OF LIBRARY CONSORTIA (ICOLC)  
GUIDELINES FOR TECHNICAL ISSUES IN REQUEST FOR PROPOSAL (RFP) REQUIREMENTS AND  
CONTRACT NEGOTIATIONS  
(JANUARY 1999)

#### INTRODUCTION

The licensing and use of electronic information resources continues to expand and, in some cases, become the sole or dominant means of access to particular resources. As such the reliability and performance of vendor hardware/software platforms through which many of these resources are accessed is of critical importance.

The participating consortia of the ICOLC have a responsibility to their library members to ensure that vendor platforms are robust and reliable; that they are connected to the Internet with adequate capacity to serve their customers; that they are technically compatible with the primary commercial web browsers; that they are ADA compliant; and that they are making adequate preparations toward Y2K compliance.

This document addresses the nature of the vendor's content and accessibility and the issues of service, quality, and response time. Based on problems identified during negotiations with the vendor before a contract is executed a variety of actions may be required, including system mirroring and the addition of network or system capacity. These actions may be specified as part of the contract. The contract may include commitments by the vendor should future problems arise.

The issues raised are complex and their treatment in vendors' systems is evolving rapidly. By design this document does not attempt to deal with them in technical detail nor in many cases in a prescriptive manner. There are a variety of options that will be preferred by consortia. It is the challenge to each vendor to negotiate the specific solutions with each consortium within the vendor's own range of capabilities.

#### I. CONTENT FORMATS

In the past many vendors provided ASCII text, the most straightforward electronic file format available. However, the rapid acceptance of the World Wide Web as the distribution channel of choice for electronic information and the proliferation of full text or full content information services have given rise to the use by content vendors of a variety of electronic file formats and new kinds of information delivery systems. Some vendors scan pages of text and deliver them as image files; others key text into databases, store the data in ASCII then apply HTML dynamically for the WWW; still other vendors create postscript files and deliver them in PDF. So, as vendors begin delivering not just screens or streams of ASCII to the users' desktop but external applications and new file formats it becomes increasingly important to discuss a variety of technical issues related to "content" during the contract negotiation.

Following are content format issues that should be discussed with the vendor:

- A. Use of plug-ins and embedded applications. The use of Java, Javascript, and plug-ins can limit the accessibility of the vendor site to particular browsers. External Java or Javascript applications are software programs that execute on the end-user's desktop system. This means that the user's system resources (memory, processor speed) may not be adequate to use a vendor's service. Plug-ins (such as Acrobat) place the burden of installing additional software on the end-user. Poorly engineered Java applets and little

used plug-ins quickly translate into a support issue for libraries. Freely available plug-ins (e.g., Acrobat Reader) or non-freely available plug-ins provided by the vendor is the preferred practice. Any plans for or restrictions that need to be placed on the use of Java, Javascript, and plug-ins need to be negotiated with the vendor.

- B. Support for Netscape and Microsoft Internet Explorer (MSIE). The vendor should guarantee that the site is accessible to Netscape and MSIE. The vendor should specify the versions of Netscape and MSIE supported by their systems. Any long-term contract should specify how compatibility with browser technology will evolve.
- C. Use of standard HTML. The contract should specify a version of HTML with which the vendor's system complies. Long-term contracts should specify how compatibility with future versions of HTML will evolve. The current version of the HTML specification is 4.0.
- D. ADA (Americans with Disabilities Act). Federal law requires that most services be accessible to the disabled.

The majority of screen-reading software or other types of software used by the disabled to access Internet sites rely on non-graphical interfaces. There is software available to support access to sites with graphical interfaces, but it does not yet seem to be sufficiently widespread for consortia to expect it will be owned by a large portion of disabled users.

To provide ADA compliance, the vendor may seek to provide a text interface available through telnet. However, this is probably a legacy interface that the vendor or library may not be planning to continue or enhance. For this reason, accessibility via text-based browsers should be developed in accordance with ADA standards and with World Wide Web Consortium (W3C) guidelines.

- E. Capturing Content. Users should be able to capture contents in one or more ways including printing, emailing, and downloading, as appropriate to the type of information and in ways that are acceptable regarding use of browsers or additional software. Content should be printed without the need of special printing software. If special printing software is needed it should be compatible with your user environment and is easy and affordable to get.
- F. Use of embedded multimedia (images, sounds, movies) files. Unless multimedia files are integral to the product the vendor should use them sparingly. The use of numerous non-essential multimedia files can place a burden on the vendors own system if it has not been properly engineered to store and deliver such files. The use of numerous non-essential multimedia files will tax the end-users system. Many vendors provide "high bandwidth" and "low bandwidth (text only) sites as options.

## **II. PLATFORMS**

There are many issues involving the hardware, software and network technology used by the vendors to store and deliver content. How the system is designed (architecture), its capacity to serve users, how the system is maintained, how access to the system is controlled, and how well the system responds to requests for information are all issues of critical importance during contract negotiations.

The following are platform issues that should be discussed with the vendor:

- A. System Architecture.

1. Z39.50 Interface. Z39.50 should be required if this protocol is used by a consortium to provide integrated access to multiple vendor systems with bibliographic content. Restrictions, such as record syntax, services, and attribute sets to be used by the vendor, should be specified in an RFP or contract.
  2. HTTP. The contract should specify the version of HTTP with which their system complies. Long-term contracts should specify how compatibility with future versions of HTTP will evolve. The current version of the HTTP standard is 1.1.
  3. Stateful vs. Stateless Interfaces. Either of these two conditions may be appropriate depending on how the vendor has designed its system and on the need to maintain and track an individual user's session. Vendor web sites can be set up to maintain either stateless or stateful connections. Where the vendor's system maintains a stateful connection between clients and servers the following are issues to be addressed during contract negotiations:
    - a. The timing out of users. An adequate time should be negotiated with the vendor.
    - b. Because in a stateful system it may be difficult for a user through a browser bookmark to monitor changes in content, for example, a new table of contents or article of an electronic journal, the vendor should provide a mechanism to alert users to new contents.
  4. Mechanism for direct access to contents. Many vendor systems are made up of multiple databases consisting of various content types (bibliographic information, complete articles, complete journals, images, etc.). Libraries construct pointers from local web sites to these various contents. This requires vendors to construct their systems so as to allow for the use of fixed URLs that point to specific content in the vendor's system or the vendor needs to supply to the consortium the means for building a script that will take users directly to the particular database..
  5. Year 2000 Compliance. The vendor should be required to certify that its system is compliant for resources that are considered critical.
- B. Access Control. All vendors do not handle access control in the same way. The consortium should state its desired approach to controlling access to electronic information being served from vendor-hosted platforms. IP authorization and user authorization (login and password) are the two most common methods of identifying valid users on a system at this time.
- C. Security/Privacy.
1. If the vendor system allows the user to purchase information or services it will be essential to determine whether the vendor provides adequate security. Even if the vendor is providing access control through a login and password protected account this does not in any way protect the information (such as credit card numbers, account numbers, passwords) being transmitted. Some form of encryption will be necessary for transactions that involve the end-user sending sensitive information through a web browser to a web server. Inquire as to the vendor's use of Secure Sockets Layer (SSL) and SHTTP (secure hypertext transfer protocol).

2. **Cookie Tracking.** As part of the non-technical portion of the contract there may be the need to limit the ability of the vendor to distribute data on the use of their site. In addition, it is important to be aware of the use of advertising on vendor sites where an ad will cause its own cookie to be loaded on the user's hard drive. This represents its own risk to privacy by enabling an external application to write to a file on the user's hard drive that information is available to other web sites.
  3. The confidentiality of individual user data is addressed in the previously issued "Guidelines for Statistical Measures of Usage of Web-based Indexed, Abstracted, and Full Text Resources", found also at [www.library.yale.consortia](http://www.library.yale.consortia).
- D. **System Management.** The following issues should be raised in an effort to determine an overall picture of system availability under normal conditions and during periods of unexpected service denial or interruption.
1. Vendor should provide advance notification (in the contract if possible) of all scheduled downtime. Vendor should provide immediate notification of all unplanned downtime.
  2. **Service Response.** The vendor should guarantee response time to service calls, e.g. 1 day.
  3. **System Monitoring.** The vendor should provide 24 hour system monitoring. This insures that the smallest increment of time will elapse between an unplanned service disruption and the vendors awareness of the problem.
  4. **Statistical Reporting.** The vendor should be required to provide statistics on the use of the system. This is addressed in the previously issued "Guidelines for Statistical Measures of Usage of Web-based Indexed, Abstracted, and Full Text Resources", found also at [www.library.yale.consortia](http://www.library.yale.consortia).
  5. **Technical Support Contacts.** The vendor should be required to provide a technical support contact in addition to sales contacts and administrative contacts. The contract should specify the contact information such as an email address, phone number, fax number and hours of availability.
  6. **Notices of Changes in System Design –** The vendor should guarantee at least three months notice of any changes in the design of their system that would require changes by the consortium members to access the site such as the versions of web browsers and URL linking.
- E. **Response Time.**
1. Prior to discussions about response time the vendor and the consortium should consider the following conditions that affect the process of determining the probable performance of the vendor's system.
    - a. **Local library bandwidth and its level of utilization.** Before evaluating the adequacy of the network capacity of the vendor, it is essential to be familiar with the adequacy of local network capacity. What may be perceived as poor performance of the vendor's system may in fact be problems that can be traced to situations such as insufficient network capacity, poor network design, local hardware problems.

- b. Nature of your user activity. Designing a performance measure requires prior determination of the type of use of a system that will occur, including:
    1. The number of simultaneous users.
    2. The number of simultaneous users who will be searching, viewing, or printing at a given time.
    3. The mix of queries to be used (e.g. number of single term versus Boolean searches, number of natural language queries).
  - c. Network distance from the consortium to the vendor. Through the use of network utilities like traceroute, it is possible to determine the path through the Internet from the consortium to the vendor. While a vendor can always buy more network capacity from their ISP (Internet Service Provider) they can do nothing about the number of networks your traffic passes through on its way to their site. It may be these intermediary networks that cause problems with performance rather than the vendor's own network, or the network of the local consortium.
2. The system's performance will need to be measured against a standard for adequate performance. This standard is not likely to be a single time. It should describe the response time expected at peak and off-peak time and the different responses expected at those times for both complex and simple queries, or for retrieval of information items, e.g. journal articles. These times should be represented by a vendor as average response times. An acceptable standard for response times should be negotiated with the vendor.

The following issues should be discussed with a vendor to clarify the response time that should be expected from a system. Appropriate standards and ongoing reporting for uptime and response times can be negotiated for inclusion in a contract. When appropriate consistency in reporting time periods with the requirements set forth in "Guidelines for Statistical Measures of Usage of Web-based Indexed, Abstracted, and Full Text Resources" is recommended.

- a. Uptime and failure during the previous year. The vendor should describe the uptime of the system for the previous year, or for the time since the system has become operational if less than a year. How often has the system failed during this time and what is the duration of the average and the longest system failure.
- b. Percentage of network capacity used. The vendor should describe the percentage of their network capacity being used to provide service to their current customer base.
- c. Performance during peak loads. The vendor should be asked to identify how fast their system has performed during peak loads.
- d. Target response times for a system. The vendor should be asked to identify how fast they want their system to perform during peak loads.

#### **ADOPTERS OF THIS STATEMENT**

This statement was adopted in principle by member representatives of the "International Coalition of Library Consortia" (ICOLC) whose institutions are listed below. This statement does not

necessarily represent the official views of each consortium listed. All consortia listed are in the United States unless otherwise noted.

**Consortia whose member representatives adopted this statement:**

- AMIGOS Bibliographic Council, Inc.
- Arizona Universities Library Consortium (AULC)
- BCR
- Big 12 Plus
- British Columbia Electronic Library Network (Canada)
- California Digital Library (CDL)
- The California State University
- Chesapeake Information Research Library Alliance (CIRLA)
- China Academic Library & Information System
- The Colorado Alliance of Research Libraries
- Committee for Institutional Cooperation (CIC)
- Commonwealth Virtual Library (CVL)
- Council of Australian University Librarians(CAUL)
- Council of Library Directors of the University System of Maryland
- Council of Prairie and Pacific University Libraries (COPPUL) (Canada)
- Florida Center for Library Automation
- Hellenic Academic Libraries Link (Greece)
- GALILEO
- Illinois Cooperative Collection Management Program (ICCMP)
- Illinois Library Computer Systems Organization (ILCSO)
- INCOLSA
- Israel Center for Digital Information Services
- Louisiana Library Network
- MERLIN
- MIRACL
- Missouri Library Network Corporation
- MOREnet

- Northeast Research Libraries Consortium(NERL)
- Network of Alabama Academic Libraries(NAAL)
- Nevada Council of Academic Libraries (NCAL)
- New England Law Library Consortium (NELLCO)
- New York Consortium of Consortia(NY C of C)
- Novanet (Canada)
- NYCRL
- OhioLINK
- Orbis
- PALINET
- Pennsylvania Academic Library Consortium, Inc. (PALCI)
- PORTALS
- SCEL - Southern California Electronic Library Consortium
- TexShare
- The Triangle Research Libraries Network (TRLN)
- UNILINC (Australia)
- University of Texas System Digital Library
- Utah Academic Library Consortium
- VIVA (The Virtual Library of Virginia)
- Washington Cooperative Library Project
- Washington Research Library Consortium

#### **About the International Coalition of Library Consortia (ICOLC)**

The International Coalition of Library Consortia (ICOLC) first met as the "Consortium of Consortia" (COC) in 1996. The Coalition is an international, informal group currently comprising over 100 library consortia in North America, Europe, Australia, Israel, China, and South Africa. The coalition membership serve primarily higher education institutions by facilitating discussion among consortia on issues of common interest. The ICOLC conducts meetings throughout the year dedicated to keeping its members informed about new electronic information resources, pricing practices of electronic providers and vendors, and other issues of importance to consortia directors and governing boards. The Coalition also meets with the information provider community, creating a forum for discussion about product offerings and issues of mutual concern.

**DOCUMENT AVAILABLE AT <http://www.library.yale.edu/consortia/techreq.html>.**



**APPENDIX 5**

**EXAMPLES SELF-ASSESSMENT AND OF STUDY GUIDES**

## SEMINOLE COMMUNITY COLLEGE: DISTANCE LEARNING SKILL SURVEY

Is Distance Learning right for you? If you are uncertain about taking a distance learning class, answer the questions below and then select the "Score Test" button at the bottom of the page to tally your score.

**1. My need to take this course now is:**

- a) High - I need it immediately for degree, job, or other important reason.
- b) Moderate - I could take it on campus later or substitute another course.
- c) Low - It's a personal interest that could be postponed.

**2. Feeling that I am part of a class is:**

- a) Not particularly necessary to me.
- b) Somewhat important to me.
- c) Very important to me.

**3. I would classify myself as someone who:**

- a) Often gets things done ahead of time.
- b) Needs reminding to get things done on time.
- c) Put things off until the last minute.

**4. Classroom discussion is:**

- a) Rarely helpful to me.
- b) Sometimes helpful to me.
- c) Almost always helpful to me.

**5. When an instructor hands out directions for an assignment, I prefer:**

- a) Figuring out the instructions myself.
- b) Trying to follow the directions on my own, then asking for help as needed.
- c) Having the instructions explained to me.

**6. I need faculty comments on my assignments:**

- a) Within a few weeks, so I can review what I did.
- b) Within a few days, or I forget what I did.
- c) Right away, or I get very frustrated.

**7. Considering my professional and personal schedule, the amount of time I have to work on Distance Learning courses is:**

- a) More than enough for a campus class or Distance Learning course.
- b) The same as for a class on campus.
- c) Less than for a class on campus.

**8. When I am asked to use VCRs, computers, voice mail, or other technologies new to me:**

- a) I look forward to learning new skills.
- b) I feel apprehensive, but try it anyway.
- c) I put it off and try to avoid it.

**9. As a reader, I would classify myself as:**

- a) Good - I usually understand the text without help.
- b) Average - I sometimes need help to understand the text.
- c) Slower than average.

**10. If I have to go to the campus to take exams or complete work:**

- a) I can go to campus anytime.
- b) I may miss some lab assignments or exam deadlines if campus labs are not open evenings and weekends.
- c) I will have difficulty going to the campus, even in the evenings and on weekends.

## PALM BEACH COMMUNITY COLLEGE:

### Should I Take a Distance Learning Class?

#### Instructions:

For each question in the quiz below select the answer that best describes you and click the radio button for your response.

1. I want to register for a distance learning class:
  - a. now because I need it immediately for a degree, job or other important reason.
  - b. although I could take it on campus later, or substitute another on campus course.
  - c. because I thought this might be an easy way to take the course but it could be postponed.
2. To me having the instructor in the classroom while learning the subject is;
  - a. not particularly necessary for me.
  - b. somewhat important to me.
  - c. very important for me to understand the material.
3. To me being with other students who are taking the class is:
  - a. not particularly necessary for me.
  - b. somewhat important to me.
  - c. very important for me to understand the material.
4. When I am assigned tasks, I:
  - a. often get things done on time or early.
  - b. need continual prompting to get things done on time.
  - c. frequently postpone work until the last minute or sometimes I am late.
5. Classroom discussions are:
  - a. rarely helpful to me and most of the time I get the material on my own.
  - b. sometimes helpful to me although I am able to learn some on my own.
  - c. almost always helpful to me because frequently I do not understand until I hear someone discuss the material.
6. When an instructor hands out directions for an assignment:
  - a. I can figure out the instructions on my own.
  - b. I can usually follow the directions on my own, but I like to be able to ask for help if needed.
  - c. I have difficulty figuring out instructions on my own and I like them explained orally first.
7. When I turn in an assignment, I expect the teacher to grade and to comment on my assignments:
  - a. within a reasonable amount of time, so I can review what I did but I do not get frustrated if it takes longer.
  - b. within a day or two, or I forget what I did.
  - c. and return them immediately or I get very frustrated and confused.
8. When I turn in an assignment, I:
  - a. am usually able to determine how well I have done.
  - b. am not always sure of how well I have done.
  - c. usually have no idea how well I have done.
9. When adding up the time I need for my job, for my family and other personal obligations, the amount of time to work on a distance learning course is:
  - a. more than enough for a campus class or a distance learning class.
  - b. the same amount of time as for taking a class on campus.
  - c. less than for taking a class on campus and that is why I want to take it off campus.
10. When I am asked to use VCRs, TVs, computers, e-mail or other technologies that may be new to me:
  - a. I have little or no difficulty learning these new skills.
  - b. I sometimes feel apprehensive, but try them anyway if I know that I can call for help when necessary.
  - c. I frequently get very frustrated and I may put off the work or even try to avoid it.
11. As a reader, I would classify myself as
  - a. a good reader and one who is able to understand the text without help.

- b. an average reader but one who needs some help to understand the text.
  - c. an average to poor reader and one who needs more help than others to understand the text or other reading material.
12. If I have to go to the campus or other testing/learning sites to take exams or complete lab work:
- a. I have time to go to the site when required.
  - b. there may be times when I will miss some labs or test dates especially if they are not open when I am available.
  - c. I would have a great deal of difficulty getting to campus or other testing/learning sites to take tests, classes or labs.
13. The VCR, tape players, TVs and computer equipment required for the class:
- a. is at home, at work or somewhere else which is readily available to me.
  - b. may be difficult at times to locate.
  - c. is not readily available to me.
14. When it comes to the organization of the class material:
- a. I can learn even if the class is not highly structured.
  - b. I like some structure in the course.
  - c. I feel very uncomfortable and have difficulty learning when a class is not highly structured.

## MIAMI-DADE COMMUNITY COLLEGE:

If you cannot answer each of the following 5 questions correctly, then the Virtual College is not for you. Click the True or False icon and read the message that appears.

1. I have easy access to a computer and to the Internet, and I have permission to download files onto that computer.
2. I know how to use my computer.
3. I can type pretty well and have basic word processing skills.
4. I like to read.
5. I want to take a class in the Virtual College because I think it will be easier than a traditional class.

If you cannot answer most of the following questions correctly, then the Virtual College will not be very easy for you.

1. I know how to download and install software from the Internet.
2. I can learn to do things by reading instructions.
3. I don't mind asking questions when I have a problem or a question.
4. I like one-on-one interactions with my professors and classmates.
5. I like to write because I can think about what I am going to say before I write it.
6. I am self-motivated and can set schedules for myself (and stick to them).
7. It is hard for me to attend regular classes at the College.

## WESTERN GOVERNORS UNIVERSITY:

Answer the following questions by selecting one answer to each question. This quiz can help you decide whether a distance-delivered course is right for you. It is for your own use only, so try to be as honest and as accurate as possible.

When you have answered all 10 questions, click the "Submit" button that appears at the bottom of the page.

1. Having face-to-face interaction with my instructors and fellow students is:
  - (a) not particularly important to me.
  - (b) somewhat important to me.
  - (c) very important to me.
2. I would classify myself as someone who:
  - (a) is good at prioritizing tasks and often gets things done ahead of time without being reminded by my instructor.
  - (b) is sometimes poor at prioritizing, needs to be reminded of assignments once in a while, and often does assignments at the last minute.
  - (c) is poor at prioritizing and sometimes forgets to complete assignments if I'm not reminded about them frequently.
3. Classroom discussion is:
  - (a) rarely helpful to me.
  - (b) sometimes helpful to me.
  - (c) almost always helpful to me.
4. When an instructor hands out instructions for an assignment, I prefer:
  - (a) figuring out the instructions myself.
  - (b) trying to follow the directions on my own, then asking for help as needed.
  - (c) having the instructions explained to me.
5. When it comes to assessing my own progress, I:
  - (a) feel as if I can keep tabs on my progress, even without immediate or frequent feedback from my instructor.
  - (b) prefer to receive regular feedback from my instructor, but don't mind if I can't get that feedback immediately after turning in a test or assignment.
  - (c) need feedback from my instructor immediately and often.
6. My need to take a distance delivered course is:
  - (a) High -- I need it immediately for a degree, job advancement or other important reason.
  - (b) Moderate -- I could take it on campus or substitute another course.
  - (c) Low -- It's a personal interest that could be postponed.
7. Considering my professional and personal schedule, the amount of time I have to work on an online course is:
  - (a) 7-9 hours per week.
  - (b) 4-6 hours per week.
  - (c) 1-3 hours per week.
8. When I am asked to use software or technologies that I haven't used before (such as e-mail, voice mail, a VCR):
  - (a) I look forward to learning new skills.
  - (b) I feel apprehensive, but try anyway.
  - (c) I put it off or try to avoid it.
9. If I had to describe my predominant learning style/preference, I would say it is:
  - (a) Auditory -- I learn best when I can listen to an explanation of a concept.
  - (b) Visual -- I learn best when I can read the course materials or view graphics and other visuals.
  - (c) Tactile -- I learn best by "doing" (for instance conducting an experiment in a lab).
10. My personal and professional schedule is:
  - (a) Predictable. I can generally plan, well in advance, blocks of time to devote to my coursework.
  - (b) Generally predictable, but sometimes last minute meetings or events come up that I cannot reschedule.
  - (c) Kind of crazy. I rarely know when I'm going to have free time that I can set aside for my coursework.

## Study Guides and Strategies

Created and maintained by [Joe Landsberger](#), Supervisor, ISS/Learning Center, [University of St. Thomas](#) (UST), St. Paul, MN. *Permission is granted to freely copy, adapt, print, transmit, and distribute Study Guides in educational, non-commercial, settings to benefit learners.* Available online at <http://www.iss.stthomas.edu/studyguides/>

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## A STUDENT GUIDE TO THE UNIVERSITY OF TORONTO

Where you study is just as important as how you study. A good study environment should be quiet and free of distractions.

- It's a good idea to have a desk which is devoted entirely to studying. You will find that you get into the habit of beginning to study as soon as you sit down.
- Turn off the television and radio. Have the answering machine, a family member or roommate take phone messages. Close the door to your room so that you are not bothered by people dropping in.
- Have everything you need, such as writing material and books, close at hand.
- Be sure you have sufficient work space. Remove everything from your study area that is not related to what you are studying at the time, so your space is uncluttered. The area should be large enough so that you can work comfortably.
- Use a chair that supports your back, not one that invites you to lounge and eventually fall off to sleep. Never study on your bed.
- Be sure that there is adequate lighting.
- Arrange your desk to face a blank wall rather than a window, so you don't become distracted by what's going on outside.

### Effective Reading

Much of your study time will be taken up in reading books, journals and articles for your courses. Of course, the way you read while studying is not like reading a book for pleasure. There is a method which can make your study reading more effective - the PSQ5R method. PSQ5R stands for Purpose, Survey, Question, Read selectively, Recite, "Rite", Reflect and Review. Here's how it works:

- **Purpose:** Before you start reading, spend 5-10 minutes determining why you are reading the material. You have to know why you are reading a book to study effectively. Are you supposed to be looking for general concepts or specific information? How does this tie into the instructor's intentions?
- **Survey:** Look quickly through the entire item you are reading and find out how it is organized, e.g. topic and chapter headings, etc. This allows you to understand the author's purpose, and what material is relevant to what you are studying. This can be a valuable way to save time.
- **Question:** Determine what questions you need to have answered before you read the material: what problems or topics are of concern to you? You will learn better if you are actively searching for answers to particular problems, and you will be better able to ration your time while reading.
- **The 5 Rs -- Read selectively, Recite, "Rite", Reflect and Review:** If you have followed the above advice, you are now ready to start reading the material, and will benefit from the work you have already done. Do your reading with the purpose and your questions in mind. If you mentally recite what you have just learned, you are much more certain to remember it. As well, you should write down what you have learned from the reading, usually in an outline or point form. At the end, you should spend a few minutes thinking about the material, and deciding whether or not your main questions have been answered by what you have read. Review the material within 24 hours to ensure that you remember what you have learned. The review should not be a rereading of the article, but an attempt to see what you remember, and if you need to review your notes again.



## Note Taking

You will need to develop note taking strategies that work with different disciplines, instructors and their varying speeds, styles and methods of lecturing. While you can sometimes persuade an instructor to slow down or repeat something, in general, you have to find a way to take notes quickly. The best way to take good notes is to think of it as an active listening process and to be selective in what you write down.

- Before the lecture, you should **read the assigned material**. If you don't have time, still spend 5-10 minutes skimming the material before the lecture. This will help you identify the most relevant information from the lecture. If you can, quickly review your notes from the last class to give you better context. From time-to-time, review the course outline to see what topic you are focusing on.
- During the lecture, **watch for cues** from the instructor as to what information is most relevant. Notice how the instructor has organized the material. If the organization is not logical to you, try to organize the material with headings yourself. If there are gaps in your notes, trade notes with classmates, or fill them in right after the class while your memory is fresh. And don't hesitate to stop your instructor and ask questions.
- **Be selective** in note taking: don't write down every word the instructor says, although you should write down any information which the professor puts on the blackboard or overheads. One technique you can use to take better notes: develop a consistent set of abbreviations for use in note taking. Also, develop a comfortable way of identifying key concepts and ideas in textbooks.
- Finally, after the lecture, **review your notes** within 24 hours. Studies have found that we can remember more things within that time period.

## Concentration

Two frequent complaints of students are that they can't concentrate while studying, and that they can't remember the material which they studied. There are many techniques for improving your concentration and memory, although you will have to see which one suits you best.

- **Plan what you are going to study in order of priority:** If you spend a lot of time reviewing information which is not vital, you will have trouble concentrating.
- **Break your study time up** into manageable periods of time, and schedule a regular break.
- **Deal with your anxieties:** Personal or course-related anxiety, daydreaming and lack of rest are the most common barriers to successful concentration. Anxiety can be alleviated by various relaxation techniques, including doing something which normally calms you. Other types of anxiety result because you see the entire task as a whole, rather than breaking it down into manageable portions.
- **Avoid distractions:** Places which are noisy, poorly lit or ventilated, or where you normally do other things, are the wrong places to study. You should pick a study spot which doesn't strain your eyes or body, where all the supplies you need are on hand, and which is a place where you will only study to maximize your concentration.
- **Try some techniques to improve your ability to memorize:** Organize and summarize your notes into essential ideas; try to remember a difficult set of concepts by turning the first letter of each word into an acronym. Constant recitation and review of course material will improve your ability to remember what you studied.

## Preparing For Exams

There are several different kinds of exams; your instructor will likely know well ahead of time what types of questions will be asked. Choose a method of preparation which suits the type of exam you'll be writing.

#### **FOR PROBLEM-SOLVING:**

Go through past homework assignments, lecture notes and your textbook. Then,

- Copy out problems.
- Mix them up.
- Solve as many as possible.
- Check your answers.
- For any you do not answer correctly, try to find similar problems and keep working on them.

#### **FOR SHORT ANSWERS:**

After reviewing your lecture notes and textbook,

- Make a list of important terms.
- Write down a definition of each term as it was used in the course.
- Think of examples or illustrations of each term.
- Figure out the term or concept's relevance to the course.

#### **FOR ESSAY QUESTIONS:**

Review old essay assignments and exams and select a number of topics that seem central to the course. Then,

- Write thesis statements containing the subject and three main points.
- Write an outline for each thesis statement (the more detail -- facts, figures, illustrations, quotations -- the better).
- Write as many essays for each of these as possible, only giving yourself as much time for each as you will have on the exam itself.
- Look over your trial essays, paying attention to areas that could be improved.

#### **FOR OBJECTIVE TESTS:**

(multiple choice, true/false, and matching questions)

- Study concepts and examples, as well as facts.
- Study your texts and notes by actively looking for the kind of material that can be answered objectively (i.e.: dates, names, precise details).
- Get old copies of exams in the same format. Look for patterns in questions and answers throughout certain disciplines.