

University of Illinois at Chicago
College of Urban Planning & Public Affairs
Graduate Program in Public Administration

Spring 2008
PA460 – Data Management

Instructor: Yonghong Wu

Phone: 996-5073

Email: yonghong@uic.edu

Office: 129 CUPPA Hall

Office hours: Monday 3:00 – 5:00 p.m. or By Appointment

Time & Place: Monday 6:00 – 9:00 p.m., 2234 ADH (Lab sessions will be in SEL2249)

Introduction

In the last several decades, the information technology has become one of the most important resources available to public and private sector managers. It is usually asserted that this technology will either (1) significantly enhance the performance of some function or task, make the organization more efficient, help employees do their jobs better, improve control over financial and/or human resources and ensure accountability for their use; (2) provide better and more timely information for managers and policy makers so that they can make better decisions; and/or (3) provide information or services to clients or the general public that will increase their satisfaction with governmental performance while increasing organizational efficiency. The rapid growth and importance of the role of information technologies for management makes this an important area for study.

As one important development of information technology, the database environment has emerged for using computers in public organizations to support decision-making at the tactical, strategic and policy levels. In this environment, end-users (project managers, policy analysts, financial managers, and other non-computer specialists) directly use computers to quickly produce the information necessary for decision-making. In the older file environment of computing, end-users depended on intermediaries (computer programmers and system analysts from the data processing department) to produce the necessary information. For many decisions, the file environment is a costly, inflexible, and slow approach to meeting information needs. The database environment is thus a key to increasing efficiency and effectiveness in public management.

The database environment has been made possible by recent developments in computer hardware providing relatively inexpensive but powerful computers and by two software innovations: (1) the database management system (DBMS) for managing the database, and (2) end-user computing via very high level non-procedural computer languages and object oriented applications. DBMS makes possible integration of data from multiple

sources for multiple purposes by multiple users, while the new computer languages support computer use by non-computer specialists to retrieve and analyze data very quickly. DBMS makes the right data available and end-user computing provides appropriate tools for the effective conversion of data to information. This process should improve the quality of decision-making in public organizations where it is successfully implemented.

The course is intended to achieve the following objectives:

- Provide an introduction to the design and use of databases. The course introduces the major data models, but focuses on the relational model, which is the easiest to use, and most flexible. Students learn the details of database design and implementation.
- Build competence in end-user computing. Students make use of MS ACCESS for hands-on experience in end-user computing applications. Through these experiences, general problem-solving techniques for working with databases will be developed.
- Apply database skills in the context of public sector problems. Cases and projects will allow students to apply their skills to design and implement public sector databases (e.g., fund accounting systems, public personnel systems, firefighting, and health inspection applications).
- Introduce students to the issues surrounding the use of information technology and particularly database management in public sector.

The course makes no assumption about the student's prior experience with computer hardware, software, and telecommunications. A potential difficulty with studying information technology is the heavy use of jargon which may confuse beginners. One way of dealing with this possibility is to find an introductory textbook on computers and information management, which contains a glossary of terms. While an investment, such a textbook may serve as a valuable long-term technical resource.

Textbooks and Reading Materials

Rob, Peter, and Carlos Coronel. *Database Systems: Design, Implementation, and Management*, 8th Edition. Course Technology: Cambridge, MA. 2008. ISBN: 1-4239-0201-7. (Referred as **RC**) – Required.

Online Training Solutions, Inc. *Microsoft Office Access 2003 Step by Step*. Microsoft Press: Redmond, WA. 2004. ISBN: 0-7356-1517-9. (Referred as **OTS**) – Required/Optional (Or a professional “How to” book on Microsoft Access 2003 or higher versions).

Some additional readings may be assigned in some class sessions. They will be available in the blackboard website, or can be downloaded through the Internet.

Assignments and Grading

Class participation and assignments	15%
Group project	35%
Mid-term exam	25%
Final exam	25%

Students are expected to have read, understood, and reflected on the assigned reading materials **prior** to class. The reading materials are listed in each session of the course schedule. After-class assignments are also required for some sessions.

Details regarding the group project are available in the Appendix.

Course Policies

Plagiarism: Plagiarism and cheating are taken very seriously and penalized severely. If you are caught plagiarizing an assignment or cheating on an exam, you will receive a grade of “F” for the course – no exceptions. There are further sanctions for academic dishonesty in accordance with university guidelines. Guidelines regarding academic integrity at UIC are available online at the following website:

http://www.vcsa.uic.edu/MainSite/departments/dean_of_students/Our+Services/Student+Judicial+Affairs.htm.

Participation by Students with Disabilities: If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible.

Incompletes, later assignments, and extra work: I do not allow students to redo assignments or do extra work to improve their grade. Late submission of assignments will be downgraded unless the student has a legitimate excuse or crisis causing the delay in completing work (i.e. illness, family emergency). Also I will only grant incompletes to students who have legitimate excuses or crisis and who make requests prior to the end of the course.

In addition, we will be making regular use of **Blackboard** system for communication in this course. For example, I will use it to make announcements to the class as well as communicate with each of you individually. I will also post lecture notes, reading materials and assignments in the course site. So I strongly encourage you to use the **UIC Blackboard Learning System** on a regular basis (<http://blackboard.uic.edu/>).

Course Schedule

January 14: Lecture 1

Topic: A. Introduction and Overview
B. Characteristics and Functions of Information Systems

Readings:

Stair and Reynolds, "An Introduction to Information Systems in Organizations" Ch.1
Heeks, R., "Reinventing government in the information age", Reinventing Government in the Information Age: International Practice in IT-enabled Public Sector Reform, Routledge, 1999, Ch.1, pp. 9-21

January 21: Martin Luther King, Jr., Day. No class.

January 28: Lecture 2

Topic: A. Database Systems
B: Conceptual Data Models

Readings:

RC, Chapters 1 & Chapter 2

Assignment 1: Chapter 1, Problem 5, 6, 7 and 8; Chapter 2, Problem 8, 9 and 10

February 4: Lecture 3

Topic: Relational Database Model

Readings:

RC, Chapters 3

Assignment 2: Chapter 3, Problem 30, 31, 32, 33 and 34

**** The Assignment 1 is due at the start of this lecture. ****

February 11: Lecture 4

Topic: Entity Relationship (ER) Modeling

Readings:

RC, Chapters 4

Assignment 3: Chapter 4, Problem 2, 3, 5 and 8

**** The Assignment 2 is due at the start of this lecture. ****

February 18: Lecture 5

Topic: Normalization of Database Tables

Readings:

RC, Chapters 5

Assignment 4: Chapter 5, Problem 21, 22, 23, 24 and 25

**** The Assignment 3 is due at the start of this lecture. ****

February 25: Lecture 6

Topic: Advanced Data Modeling

Readings:

RC, Chapters 6

Assignment 5: Chapter 6, Problem 4 and 5

**** The Assignment 4 is due at the start of this lecture. ****

March 3: Lecture 7

Topic: Structured Query Language (SQL)

Readings:

RC, Chapters 7 & Chapter 8

**** The Assignment 5 is due at the start of this lecture. ****

March 10: Midterm Exam

March 17: Lecture 8

Topic: A. Database Design

B. Information Management and Strategy in Public Sector

Readings:

RC, Chapters 9

Cats-Baril and Thompson, "Managing Information Technology Projects in the Public Sector", *Public Administration Review* 55(6), November/December 1995

March 24: Spring vacation. No class!!

March 31: Lecture 9

Topic: MS Access Lab Session 1

Readings:

OTS, Chapter 1, Chapter 2 and Chapter 3

April 7: Lecture 10

Topic: MS Access Lab Session 2

Readings:

OTS, Chapter 5 and Chapter 6

April 14: Lecture 11

Topic: MS Access Lab Session 3

Readings:

OTS, Chapter 4

April 21: Lecture 12

Topic: MS Access Lab Session 4

Readings:

OTS, Chapter 7 and Chapter 8

April 28: Project Presentations

May 5: Final Exam

Appendix – Group Database Project

The purpose of this project is to provide each student with the opportunity to participate in a realistic data base design project. This assignment will be carried out in teams and will run for about seven weeks. Each team is required to develop and complete its database project for a real public or non-profit organization.

The textbook provides useful guides for designing a data base. The case study should give you a good idea of how to carry out a data base design through the logical model stage. Also, the ACCESS book will help you with the implementation stage.

Some Ground Rules

- 1 Each project team will have one group grade. All group members receive the same grade.
- 2 Each team will select a team leader. Team leaders will have responsibility for scheduling meetings, allocating work assignments and in general managing the project.
- 3 Each group will identify who the team leader is as soon as possible. I recommend the groups use the Blackboard system for communication. Also, each group leader should set up a meeting with me as soon as they are chosen.
- 4 Since you will be working with a real organization and real administrators, it is expected that you will behave in a professional manner.
- 5 It is also expected that all communications between project team and the organization, written or oral are confidential and must be treated as such.
- 6 The instructor will act as a general consultant to each of the project teams.

Project Outputs and Deliverables

1. All outputs from the project must be computer produced. Written material must be done as Microsoft Word (or a word processor of your choice) documents, other forms of output can be produced by ACCESS if necessary.
2. Deliverables
 - A. Each team must hand in a final project report to include:
 - a. All assumptions used in developing your data base design
 - b. A data dictionary
 - c. A cross-reference chart between data elements and reports
 - d. A conceptual database model
 - e. A logical database model in relational form (Relational Schema)
 - f. A listing of all program code (documented) IF YOU USE MODULES
 - g. A description on how to use the demonstration system - User Manual
 - h. An implementation plan for the organization

- 1) Data collection and entry procedures (who, where, when, etc.)
 - 2) Data checking and verification process
 - 3) Software selection and evaluation (If your demo software will not be used)
 - 4) Program maintenance and updates
 - 5) Provisions for backing up the data base
- B. A disk with the system and a sufficient amount of data to test the system
- a. The system should be menu driven
 - b. All reports and forms necessary to implement the system should be included
4. The group must prepare a 30 minute oral presentation of their project to be presented in class.
 5. The group is encouraged to make an oral presentation to the sponsoring organization.
 6. Final project reports are due on **May 5th**.