Practical Development of Information System in Business Context:
Attendance System for Assumption University

Mr. Krisada Pornlertpeeti

Project Name: Attendance System for Assumption University

Intern: Mr.Krisada Pornlertpeeti

Advisor: A.Patamate Darnphitsanupan

Academic Year: 2002

The Department of Business Computer, ABAC School of Management has approved the aforementioned student's BC 4500 280-Hour Training Project, which includes complete documentation and program as a partial fulfillment of the requirements for the Bachelor's Degree of Business Administration in Business Computer

Advisory Committee:

(A.Patamate Darnphitsanupan)	(A.Patamate Darnphitsanupan)
Advisor	Chairperson

(A.Swati Prabhu)	(A.Somchai Chaowapatanawong)
Member	Member

December 2002

Practical Development of Information System in Business Context:

Attendance System for Assumption University.

Advisor: A. Patamate Darnpitsanupun

BC 4500 280 HOUR TRAINING PROGRAM WRITE-UP

Prepared by
Mr. Krisada Pornlertpeeti

Submitted in Partial Fulfillment
of the Course BC 4500 280 Hour Training Program
Bachelor's Degree of Business Administration
in Business Computer Program
Assumption University

December, 2002

TABLE OF CONTENTS

I. INTRODUCTION

1.1 Background of the Organization

Assumption University ABAC is one of the international university in Thailand. Purpose of the company is to have high quality in education. We hope that our education can compare with international school in other countries. So we provide international lecturer in order to improve students' English language. After that our student can know business with excellent in English too.

The university are located in two places, the first is at Huamark Rd., Bangkok. And the second one is at Bangna Rd., Km. 26 The company has about over 30,000 students and over 2,000 lecturers.

There are 3 main divisions in the Assumption University. The Attendance system is the system to be Operated under Administrative Department. The following figures show the Assumption University's organization chart and department chart.
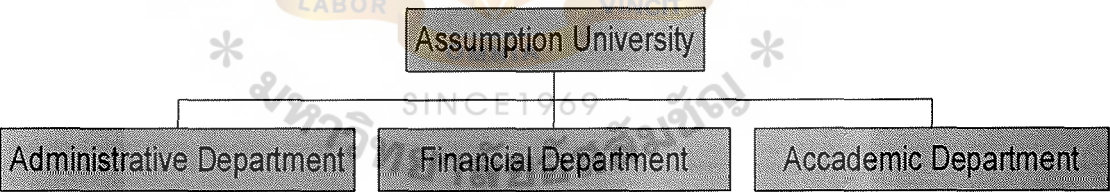
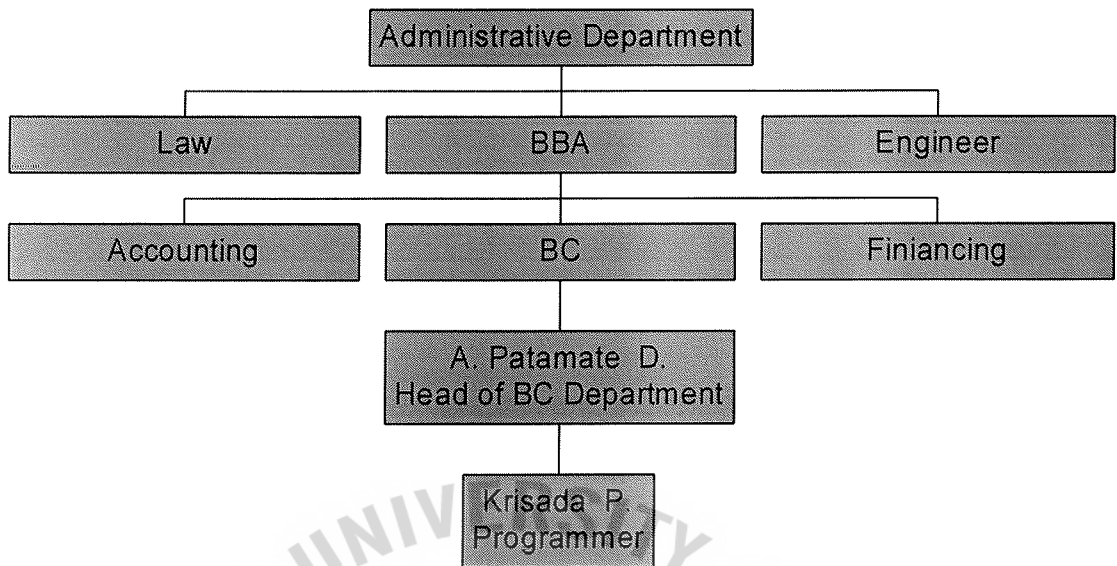Figure 1-1   Organization Chart of Assumption University

```
                    ┌─────────────────────────────┐
                    │  Administrative Department   │
                    └──────────────┬──────────────┘
        ┌──────────────────────────┼──────────────────────────┐
  ┌───────────┐            ┌───────────────┐            ┌───────────────┐
  │    Law    │            │      BBA       │            │   Engineer     │
  └───────────┘            └───────┬────────┘            └───────────────┘
  ┌───────────────┐        ┌───────────────┐            ┌───────────────┐
  │  Accounting   │        │      BC        │            │  Finiancing    │
  └───────────────┘        └───────┬────────┘            └───────────────┘
                           ┌──────────────────┐
                           │  A. Patamate  D.  │
                           │ Head of BC Department │
                           └───────┬──────────┘
                              ┌──────────────┐
                              │  Krisada  P.  │
                              │  Programmer   │
                              └──────────────┘
```

Figure 1-2   Department Chart

1.2   Objectives of the System

(1)   To study the existing system for the understanding on the current operation.

(2)   To analyze the causes of problems of the existing system and solve them.

(3)   To improve Attendance Checking system performance.

(4)   To change manual work into computer system.

(5)   To implement the new system in the real working context.

1.3   Scope of the System

(1)   To Extract Attendance Data to the diskette

(2)   To Check Enrollment Information.

(3)   To Update Attendance Data into database.

(4)   To Check History Attendance Data.

2

(5)   To Estimate Attendance and view report of absentees who absented more than limit.

1.4   Project Plan

The tentative plan for this project: "Attendance System of Assumption University." is exhibited in Figure 1.3.

No.	Task Name	September				October				November				December			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	I. Analysis of the Existing System																
1.	Study the Existing System																
2.	Identify the Existing Problems																
3.	Existing Data Flow Diagram																
	II. Preliminary Investigation																
4.	Define the objectives and scope																
5.	Hardware Requirements																
6.	Software Requirements																
	III. Analysis and Design of the Proposed System																
7.	Entity-Relationship Diagram																
8.	Database Design																
9.	Data Flow Diagram																
10.	Process Specification																
11.	Data Dictionary																
12.	Interface Design																
13.	Report Design																
	IV. Implementation of the Proposed System																
14.	Coding																
15.	Testing																
16.	Documentation																

Figure 1-3   Project Plan for Assumption University. Attendance System

II. THE EXISTING SYSTEM

2.1 Background of Existing System

Currently, the Attendance system of the Assumption University is operated by document and human control. And administrative department will control these documents.

When the Registration is finished, Administrative will create attendance sheet for each lecturer. One attendance sheet is printed out for one section of the subject. After that, lecturers will use these attendance sheets in order to check attendance of the students of each class.

When lecturers finish their checking attendance, they will return these attendance sheets to the administrative again in order to check and update data into the database by using hand check. After that administrative department will estimate the student who absent more than limit in order to print out and inform these students by send these document to lecturers again.
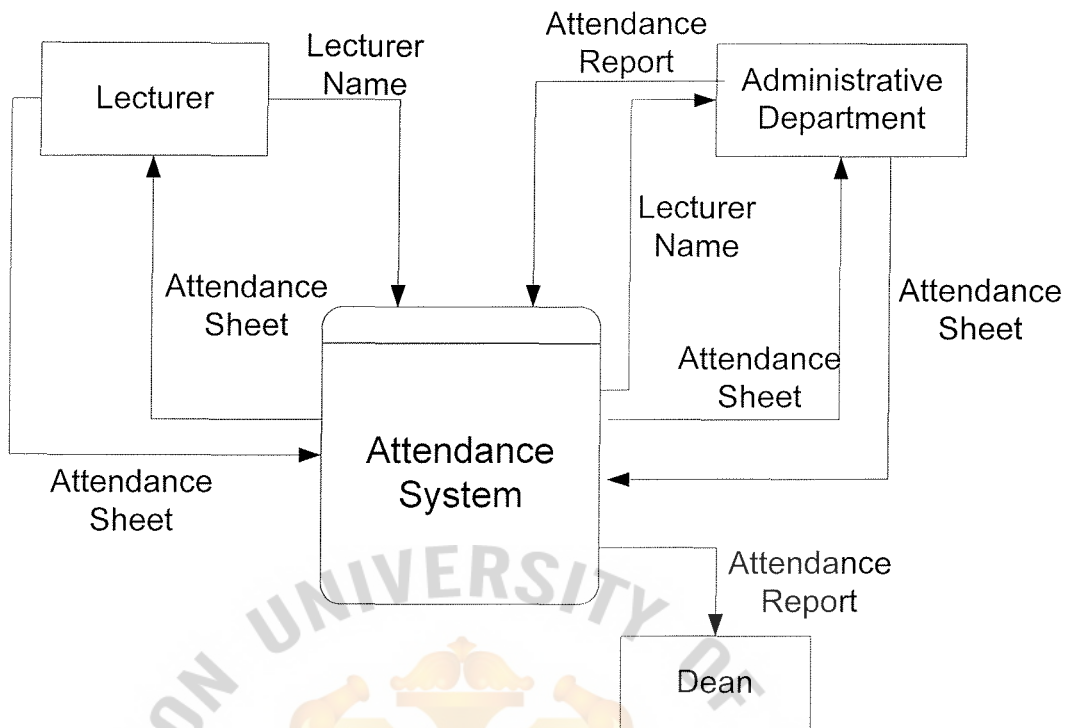
Figure 2-1   Context Diagram of Existing System

2.2   Problem Definition

(1)   Difficulties in checking the time of absent of each student

The attendance system's checking is base on hand checking, so it has high opportunity to mistake of checking.

(2)   Difficulties in controlling documents.

The attendance system is keeping in a form of document, so it hard to control such as losing and damage etc. And it hard to recovery data in the case of losing.

(1)   Difficulties in searching documents.

It is hard to searching data when data is required to in any case.

III. THE PROPOSED SYSTEM

3.1 System Specification

(1) Hardware Requirements

Table 3-1 Hardware Requirements

HAREWARE	SPECIFICATION
CPU	Pentium IV 1.6 GHz
RAM	DDR Ram 128 MB
Hard disk	40 GB

The suggested hardware requirements are proper in terms of price and quality. For the Pentium and Ram, they are both compatible with each other. And the size of harddisk is proper for the size of database. And it is the middle price harddisk available in the market now.

(2) Software Requirements

Table 3-2 Software Requirements

SOFTWARE	SPECIFICATION
Operating System	Microsoft Windows 98
Application	1. Microsoft Office 2000 2. Visual Basic 6.0 (SP 5)

7

The suggested software requirements are the software which are mostly used by many people. For the Operating System, Microsoft Windows 98 is the one that is standard and compatible with many program. This is one of the reason why Windows 98 is chose. For the programs, Microsoft Office 2000 and Visual Basic 6.0 are the requirement for this program.

3.2 System Design

(1) Data Flow Diagram

"Data Flow Diagram is a graphically characterize data processes and flow in a business system. In their original state data flow diagrams the broadest possible overview of system inputs, processes and outputs, which correspond to those of the general systems model. A serried of layered data flow diagrams may also be used to represent and analyze detailed procedures within large system." (Kendall 1999:235)
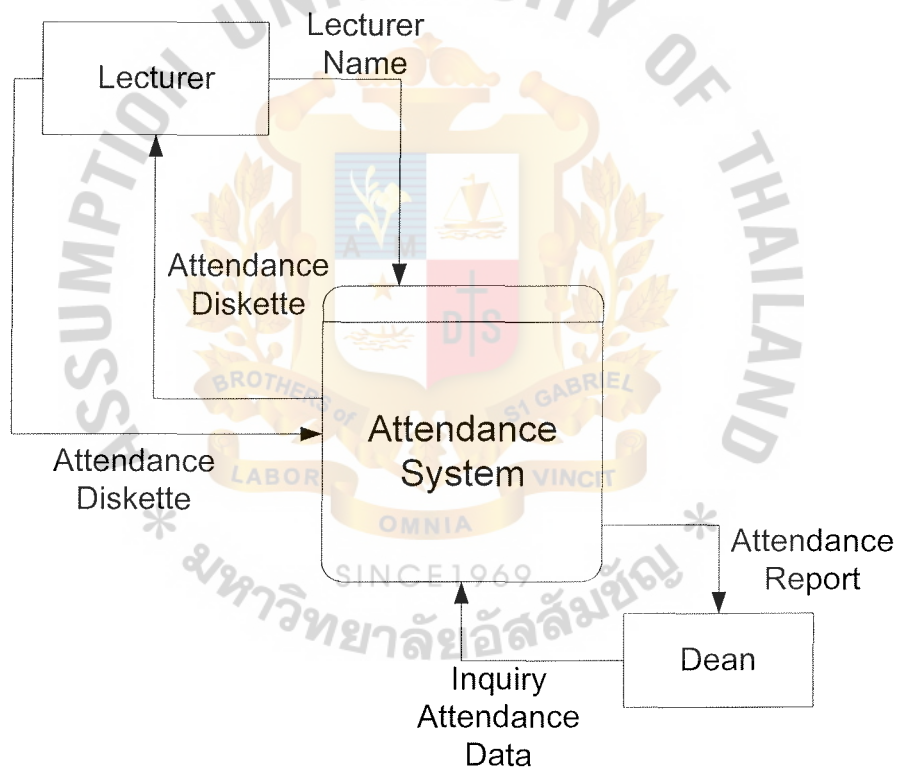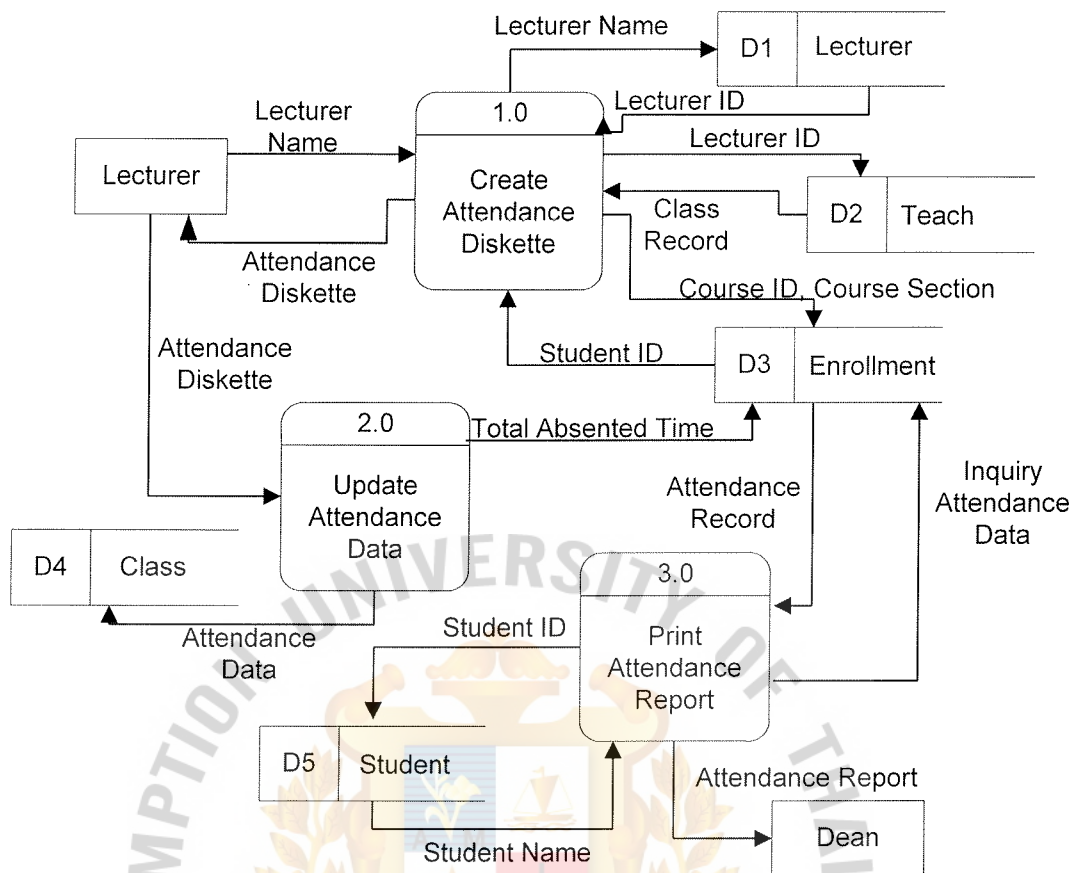

Figure 3-1   Context Diagram
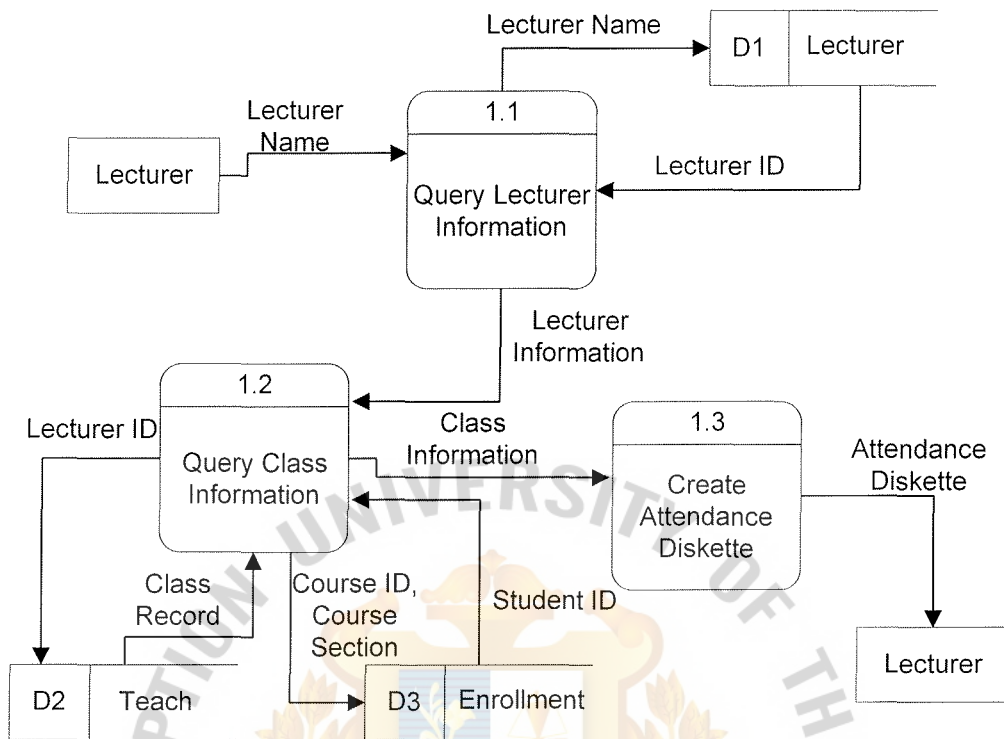
Figure 3-2   Data Flow Diagram – Level 0

Figure 3-3   Data Flow Diagram – Level 1 – Process 1.0
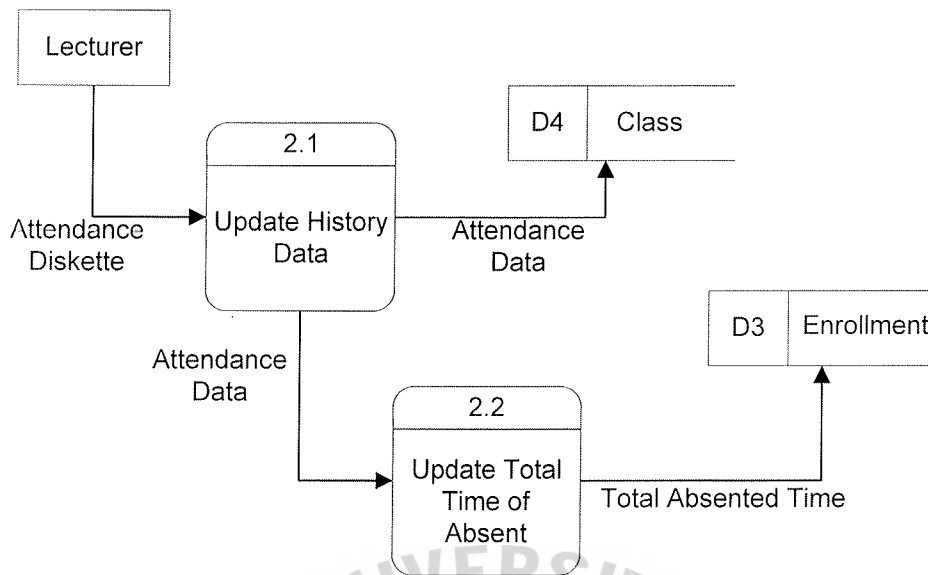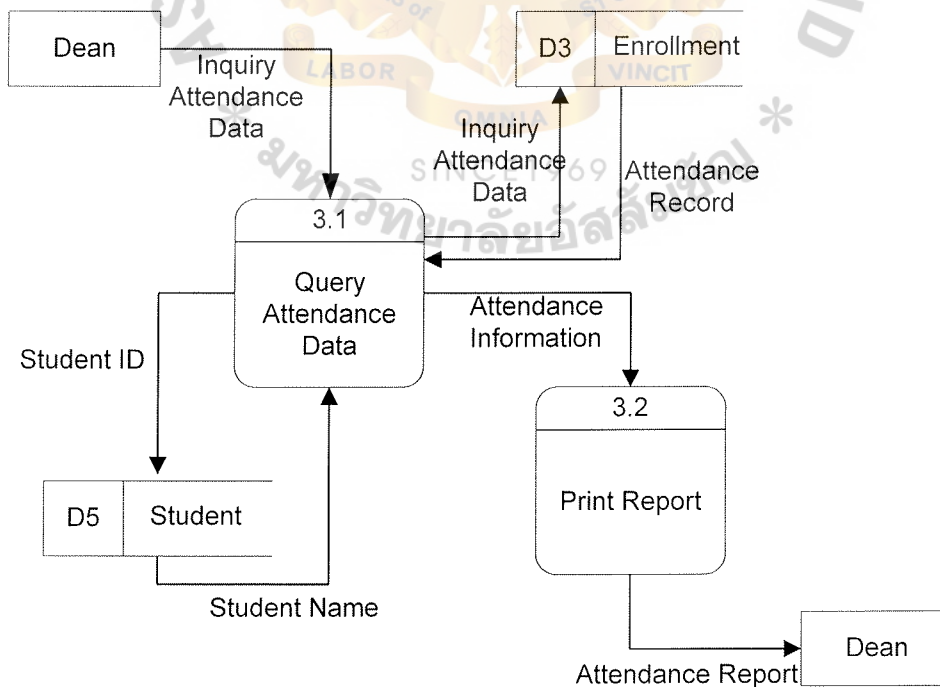
Figure 3-4   Data Flow Diagram – Level 1 – Process 2.0

Figure 3-5   Data Flow Diagram – Level 1 – Process 3.0

12

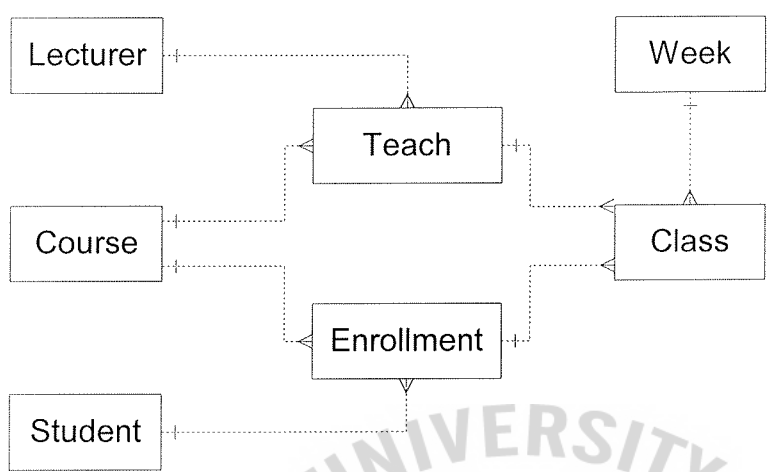(2)   Entity-Relationship Diagram

Figure 3-8   Entity-Relationship Diagram

(3)   Database Design

Student Table

Student table is used for keeping Student information. This table consists of Student ID, Student First Name and Student Last name. Primary key of this table is Student ID which cannot be repeating and null value. This table is exhibited in Appendix A Table A-1.

Course Table

Course table is used for keeping Course information. This table consists of Course ID and Course Name. Course ID is the primary key of this table. This table is exhibited in Appendix A Table A-2.

Lecturer Table

Lecturer table is used for keeping Lecturer information. This table consists of Lecturer ID, Lecturer First Name and Lecturer Last Name. Lecturer ID is primary key of this table. This table is exhibited in Appendix A Table A-3.

Week Table

Week table is used for keeping Week information. This table consists of Week No., Week Start and Week End. Week No is the primary key of this table. This table is exhibited in Appendix A Table A-4.

Teach Table

Teach table is used for keeping the Class information of each Lecturer. This table consists of Course ID, Course Section and Lecturer ID. Course ID and Course Section are concatenate primary key. Course ID is foreign key of this table which referred from the Course Table. And Lecturer ID is foreign key of this table which referred from the Lecturer Table. This table is exhibited in Appendix A Table A-5.

14

Enrollment Table

Enrollment table is used for keeping the Enrollment information of each Student. This table consists of Student ID, Course ID, Course Section and Total. Student ID, Course ID and Course Section are concatenate primary key. Student ID is the foreign key of this table which referred from the Student table. And Course ID is foreign key of this table which referred from the Course Table. This table is exhibited in Appendix A Table A-6.

Class Table

Class table is used for keeping the Student History information. This table consists of Week No, Student ID, Course ID, Course Section, Class1, Class2, Lab1, and Lab2. Week No, Student ID, Course ID and Course Section are concatenate primary key of this which cannot be repeating and null value. This table is exhibited in Appendix A Table A-7.

Administrator Table

Administrator table is used for keeping the administrator information. This table consists of Administrator's Name, Administrator's Password. Administrator's Name is primary key. The Password field cannot be null value also. This table is exhibited in Appendix A Table A-8.

(4) Process Specification

"Process specifications, sometimes called minispecs because they are a small portion of the total project specifications, are created for primitive processes on a data-flow diagram as well as for some higher-level processes that explode to a child diagram. They explain the decision making logic and formulas that will transform process input data into output. Each derived element must have been process logic to show how it is produced from the base elements or other previously created derived elements that are input to the primitive process." (Kendall 1999:341)

Table 3-3   Process Specification for Process 1.0

Process Name:	Create Attendance Diskette
Data In:	(1) Lecturer Name (2) Lecturer ID (3) Class Record (4) Student ID
Data Out:	(1) Lecturer Name (2) Lecturer ID (3) Course ID, Course Section (4) Attendance Diskette
Process:	(1) Get Lecturer Information by query by Lecturer Name (2) Get Class Information by query by Lecturer ID (3) Use Class Information to create Attendance Diskette
Attachment:	(1) Lecturer

	(2) Lecturer Record D1
	(3) Teach Record D2
	(4) Enrollment Record D3

Table 3-4   Process Specification for Process 1.1

Process Name:	Query Lecturer Information
Data In:	(1) Lecturer Name (2) Lecturer ID
Data Out:	(1) Lecturer Name (2) Lecturer Information
Process:	(1) Get Lecturer Information by query by Lecturer Name
Attachment:	(1) Lecturer (2) Lecturer Record D1 (3) Process 1.2

Table 3-5   Process Specification for Process 1.2

Process Name:	Query Class Information
Data In:	(1) Lecturer Information (2) Class Record (3) Student ID
Data Out:	(1) Lecturer ID (2) Course ID, Course Section (3) Class Information

17

Process:	(1) Get Class Information by query by Lecturer ID
Attachment:	(1) Teach Record D2 (2) Enrollment Record D3 (3) Process 1.1 (4) Process 1.3

Table 3-6   Process Specification for Process 1.3

Process Name:	Create Attendance Diskette
Data In:	(1) Class Information
Data Out:	(1) Attendance diskette
Process:	(1) Use Class Information to create Attendance Diskette
Attachment:	(1) Lecturer (2) Process 1.2

Table 3-7   Process Specification for Process 2.0

Process Name:	Update Attendance Data
Data In:	(1) Attendance Diskette
Data Out:	(1) Attendance Data (2) Total Absent Time
Process:	(1) Update History Data by using Attendance Data from Attendance Diskette (2) Update Total Absent Time of each student
Attachment:	(1) Enrollment Record D3

18

	(2) Class Record D4
	(3) Lecturer

Table 3-8   Process Specification for Process 2.1

Process Name:	Update History Data
Data In:	(1) Attendance Diskette
Data Out:	(1) Attendance Data
Process:	(1) Update History Data by using Attendance Data from Attendance Diskette
Attachment:	(1) Lecturer
	(2) Class Record D4
	(3) Process 2.2

Table 3-9   Process Specification for Process 2.2

Process Name:	Update Total Time of Absent
Data In:	(1) Attendance Data
Data Out:	(1) Total Absent Time
Process:	(1) Update Total Absent Time of each student
Attachment:	(1) Process 2.1
	(2) Enrollment D3

Table 3-10   Process Specification for Process 3.0

Process Name:	Print Attendance Report
Data In:	(1) Attendance Record

	(2)	Student Name
Data Out:	(1)	Inquiry Attendance Data
	(2)	Student ID
	(3)	Attendance Report
Process:	(1)	Get Attendance Information by using Inquiry Data from Dean
	(2)	Print Attendance Report by using Attendance Information
Attachment:	(1)	Enrollment D3
	(2)	Student D5
	(3)	Dean

Table 3-11   Process Specification for Process 3.1

Process Name:	Query Attendance Data	
Data In:	(1)	Inquiry Attendance Data
	(2)	Attendance Record
	(3)	Student Name
Data Out:	(1)	Inquiry Attendance Data
	(2)	Student ID
	(3)	Attendance Information
Process:	(1)	Get Attendance Information by using Inquiry Data from Dean
	(2)	Get Student Name by using Student ID
Attachment:	(1)	Dean
	(2)	Enrollment Record D3

20

	(3)	Student Record D5
	(4)	Process 3.2

Table 3-12   Process Specification for Process 3.2

Process Name:	Print Report	
Data In:	(1)	Attendance Information
Data Out:	(1)	Attendance Report
Process:	(1)	Print Attendance Report by using Attendance Information
Attachment:	(1)	Process 3.1
	(2)	Dean

(5) Data Dictionary

Table 3-23   Data Dictionary of Order Processing System Database

Field Name	Data Type	Require	Meaning
Adm_id	Character(7)	7 Digit	User ID of this program that use to login when start this program
Adm_pass	Character(10)		User Password that use to login when start this program
Cls1	Number(3,2)		Absent time in hours of First Class of each week
Cls2	Number(3,2)		Absent time in hours of Second Class of each Week
Course_id	Character(5)	5 Digit	Identification number of each Subject
Course_name	Charater(30)		Full Name of each Subject
Course_sec	Number(3)		Section of each Subject
End	Date (mm/dd/yyyy)		Date that is the end date of each week
Lab1	Number(3,2)		Absent time in hours of First Lab of each week
Lab2	Number(3,2)		Absent time in hours of Second Lab of each week

22

Lec_fname	Character(15)		First Name of Lecturer
Lec_ID	Character(7)	7 Digit	Identification Number of Lecturer
Lec_lname	Character(30)		Last Name of Lecturer
Start	Date (mm/dd/yyyy)		Date that is the Start date of each week
Stu_fname	Character(15)		First Name of Student
Stu_ID	Character(7)	7 Digit	Identification Number of Student
Stu_lname	Character(30)		Last Name of Lecturer
Total	Number(4,2)		Total Absent of each Student
Week	Number(2)		Number of Week in each term

Table 3-24   Data Dictionary of Data Flow Diagram

Data Flow	Meaning
Attendance Data	Information about the attendance of student.
Attendance Diskette	Diskette that contain Attendance Data of each subject.
Attendance Record	Information about the attendance of student.
Attendance Report	List of absentees Report.
Class Record	Information about attendance of student.
Course ID	Identification number of each subject.

23

Course Section	Number of Section of each subject.
Inquiry Attendance Data	Data that set in order to estimate Attendance Report
Lecturer ID	Identification number of each lecturer.
Lecturer Name	Full Name of each lecturer.
Student ID	Identification number of each student.
Student Name	Full Name of each student.
Total Absented Time	Total time of absent of each student.

(6) Interface Design

Login Form

This form is used for log in the system. Only the authorized person, which is Administrator, can access into the system. This form is exhibited in Appendix B Figure B.1.

Main Menu Form

This form is a main menu for user to switch to another forms. This form is exhibited in Appendix B Figure B.2.

Create Attendance Diskette Form

Create Attendance Diskette form is used for query class information of each lecturer and extract them to diskette in a form of Excel Files. One Excel File is for One section of subject. This form is exhibited in Appendix B Figure B.3.

Update Attendance Data Form

Update Attendance Data form is used for updating attendance from attendance diskette which is returned by lecturer after they finished their checking attendance. Attendance data will be update into database and calculate the total

24

absent time for each student and update to the database. This form is exhibited in Appendix B Figure B.4.

Check Course Information Form

Check Course Information form is used for searching enrollment course information of the student in the case that administrator would like to know that which courses are belong to each student. So this form is convenience for finding enrollment information of one student. This form is exhibited in Appendix B Figure B.5.

Check History Data of Attendance Form

Check History Data of Attendance form is used for checking history of Attendance Data about how many absent time for each student. This form is exhibited in Appendix B Figure B.6.

Estimate Attendance Data Form

This form is used Estimate list of the student who absent more than limit that Dean had set it. And this report will print for Dean in the form of Data Report. This form is exhibited in Appendix B Figure B.7.

(7) Report Design

List of Absentees Report

List of Absentees Report is used to show the list of Absentees who be absented more than limit.

[Explain and list the reports, and state that the Report Design is exhibited in Appendix C.]

IV.   SYSTEM IMPLEMENTATION

4.1   Overview of the System Implementation

The implementation of the Assumption University is direct changeover. "Conversion by direct changeover means that on a specified date, the old system is dropped and the new system is put into use. Direct changeover can only be successful if extensive testing is done beforehand, and it works best when some delays in processing can be tolerated. Sometimes, direct changeover is done in response to a government mandate. An advantage of direct changeover is that users have no possibility of using the old system rather than the new one. Adaptation is a necessity."

4.2   Test Plan

Validating input transactions

"Validating input transactions is largely done through software, which is the programmer's responsibility, but it is important that the systems analyst know that common problems might invalidate a transaction. Businesses committed to quality will include validity checks as part of their routine software.

Two main problems can occur with input transactions: submitting the wrong data the system or asking the system to perform an unacceptable function." (Kendall 2001:727)

Submitting the Wrong Data.

An example of submitting the wrong data to the system is the attempt to input character instead of numeric in the Absent Percentage number in the Estimate Data form. "This error is usually an accidental one, but it should be flagged before data are processed." (Kendall 2001:727)

Asking the System to Perform an Unacceptable Function.

"The third error that invalidates input transactions is asking the system to perform an unacceptable function." (Kendall 2001:727) For instance, in the Update Attendance Data Form User have to insert diskette into Drive A before choose to update data in Drive A.

Test for Missing Data.

"The first kind of validity test examines data to see if there are any missing items. For some situations, all data items must be present." (Kendall 2001:727) For example, Missing to select lecturer's name before extract data in the create attendance diskette form.

"In addition, the record should include both the key data that distinguish one record from all others and the function code telling the computer what to do with the data. The systems analyst need to interact with users to determine what data items are essential and to find out whether exceptional cases ever occur that would allow data to be considered valid even if some data items were missing." (Kendall 2001:728)

Test for Class or Composition.

"The test for class or composition validity test checks to see that data fields that are supposed to be exclusively composed of numbers do not include letters and vice versa." (Kendall 2001:728) For example, user attempt to input the character instead of numeric in the product's quantity input in the customer order form or purchase order form.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

After implementing the new system into the real context, it can reduce human errors checking the attendance sheets. The new system can manage attendance system more efficient, users will use attendance diskette to check attendance data and update attendance data.

5.2 Recommendations

The History Attendance Data report is required for the manager. History Attendance report should be done. Because the new system has just only the report that generate the list of Absentees. For further application, the design coloring and raw materials formula calculating are required to be in the program in order to generate the most effective computer system to the university, but now the system could not afford those requirements yet.

APPENDIX A
DATABASE DESIGN

Table A-1. Lecturer Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Lec_id	Varchar(7)	Y	Y		Teach		Primary key
2	Lec_fname	Varchar2(30)						Attribute
3	Lec_lname	Varchar2(50)			Y			Attribute

Table A-2. Student Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Stu_id	Varchar2(7)	Y	Y		Enrollment		Primary key
2	Stu_fname	Varchar2(30)						Attribute
3	Stu_lname	Varchar2(50)			Y			Attribute

Table A-3. Course Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Course_id	Varchar2(6)	Y	Y		Enrollment, Teach		Attribute
2	Course_name	Varchar2(50)						Attribute

30

Table A-4.   Enrollment table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Stu_id	Varchar2(7)	Y	Y		Class		Primary key, Foreign key
2	Course_id	Varchar2(6)	Y	Y		Class		Primary key, Foreign key
3	Course_sec	Varchar2(3)	Y	Y				Primary key
4	Total	Number(4,2)			Y		> 0	Attribute

Table A-5.   Teach Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Course_id	Varchar2(6)	Y	Y		Class		Primary key, Foreign key
2	Course_sec	Varchar2(3)	Y	Y		Class		Primary key, Foreign key
3	Lec_id	Varchar2(7)						Foreign key

31

Table A-6. Week Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Week	Number(2)	Y	Y		Class		Primary key
2	Start	Date(10)						Attribute
3	End	Date(10)						Attribute

Table A-7. Class Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Week	Number(2)	Y	Y				Primary key, Foreign key
2	Stu_id	Varchar2(7)	Y	Y				Primary key, Foreign key
3	Course_id	Varchar2(6)	Y	Y				Primary key, Foreign key
4	Course_sec	Varchar2(3)	Y	Y				Primary key, Foreign key
5	Cls1	Number(3,2)						Attribute
6	Cls2	Number(3,2)						Attribute
7	Lab1	Number(3,2)			Y			Attribute
8	Lab2	Number(3,2)			Y			Attribute

Table A-8. Administor Table

No.	Field name	Field Type	Index	Unique	Nullable	Foreign key to table	Check	Key type
1	Adm_id	Varchar2(20)	Y	Y				Primary key
2	Password	Varchar2(20)			Y			Attribute

APPENDIX B
INTERFACE DESIGN

Figure B-1   Login Form

Figure B-2   Main Menu Form

Figure B-3   Create Attendance Diskette Form

37
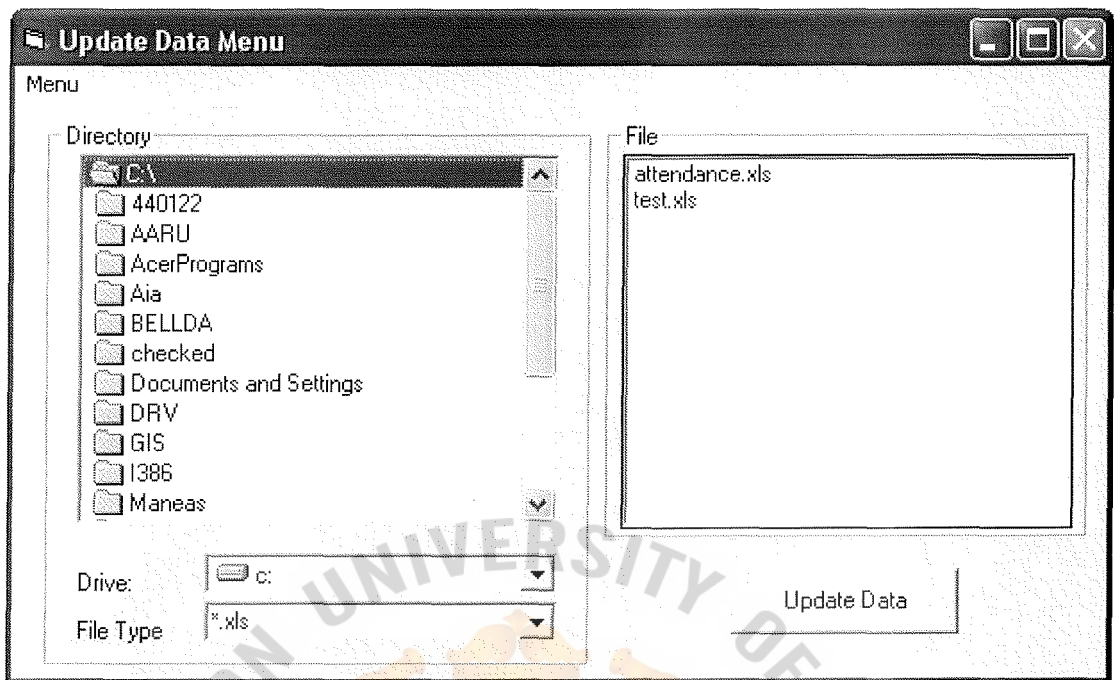
Figure B-4   Update Attendance Data Form

Figure B-5   Check Course Enrollment Information Form

Figure B-6   Estimate Attendance Data Form

APPENDIX C
REPORT DESIGN

List Report Of Absentees Of All Subject

Date :   Sunday, December 15, 2002   **Time :** 11:57:24 PM

Student ID	Course ID	Section	Total Absent (Hours)		(45 hours)
4113079	BC2501	404	15	Hrs.	
4010238	BC3940	412	15	Hrs.	

Figure C-1   Customer Report

BIBLIOGRAPHY

REFERENCES:

1. Gibson, Michael L. and Cary T. **Hughes. Systems Analysis and Design: A Comprehensive Methodology with Case.** MA: boyd & fraser, 1994.

2. Kendall, Kenneth E. and Julie E. Kendall. **System Analysis and Design**, Fourth Edition. NJ: Prentice-Hall, 1999.

3. Post, Gerald V. and David L. Anderson. **Management Information Systems: Solving Business Problems with Information Technology,** Second Edition. USA: McGraw Hill, 2000.

4. O'Brien J. A. **Management Information Systems: Managing Information Technology in the Internetworked Enterprise,** Fourth Edition. USA: McGraw Hill, 1999.