ONLINE POSTGRADUATE COURSE REGISTRATION AND PAYMENT SYSTEM AT FSKTM, UM.

A Dissertation Submitted To The
Faculty Of Computer Science And Information Technology
University Of Malaya

By

SEE CHUN KIAT

In Partial Fulfillment Of The Requirement For The
Degree Of Master Of Information Technology

October 2002
ABSTRACT

An Online Postgraduate Course Registration and Payment System is developed for postgraduate students in the Faculty of Computer Science and Information Technology (FSKTM), University of Malaya (UM). It is a Web application development. The system is developed to facilitate student online course registration and payment of fees. The system overcomes the queuing problem during the course registration and fees payment. UM administrators can view, delete and update the course registration, student, and administrative record through the system. ASP (Active Server Pages) is used to develop the system. Microsoft Access 2000 is used to store the student database.
ACKNOWLEDGEMENT

I would like to thank my supervisor, Associate Professor Dr. P. Sellappan, who has given me helpful advice throughout my project. It is only with his encouragement and support that I am able to complete this project.

Further thanks to all the general staff at the Faculty of Computer Science and Information Technology, especially Miss Agnes, for their generous help wherever possible.

See Chun Kiat

Faculty of Computer Science and Information Technology

University of Malaya

October 2002
# TABLE OF CONTENTS

**ABSTRACT**  

**ACKNOWLEDGEMENT**  

**TABLE OF CONTENTS**  

**LIST OF FIGURES**  

**LIST OF TABLES**  

**1.0 INTRODUCTION**  

1.1 Introduction of the Project  
1.2 Problem Statements  
1.3 Mission  
1.4 Objectives  
1.5 Project Scope  
1.6 Expected Outcomes  
1.7 Report  

**2.0 LITERATURE REVIEW**  

2.1 Interactive Features Through Internet  

2.1.1 HTML (Hypertext Markup Language)  
2.1.2 Cascading Style Sheets (CSS)  
2.1.3 Dynamic HTML  

2.1.3.1 Data Binding  
2.1.3.2 Fonts  
2.1.4 Differences Between Netscape and Microsoft Version Of CSS and Dynamic HTML  
2.1.5 Common Gateway Interface (CGI)  
2.1.6 Hypertext Transfer Protocol  

2.2 Web Application Development  
2.3 Database Server  
2.4 Database Management System (DBMS)  
2.5 Data Access Interface Paradigm  

2.5.1 ODBC Data Source Administrator  
2.6 Client/Server Development  
2.7 Case Studies  

2.7.1 Case Study 1  
2.7.2 Case Study 2  
2.7.3 Case Study 3  
2.7.4 Case Study 4  
2.7.5 Case Study 5  
2.7.6 Case Study 6  

2.8 Database Consideration
  2.8.1 Microsoft Access
  2.8.2 Conclusion of The Database Consideration
2.9 System Application Development Tools Consideration
  2.9.1 Microsoft Visual Basic 6.0
  2.9.2 Visual C++
  2.9.3 Active Server Pages (ASP)
  2.9.4 Microsoft Personal Web Server
  2.9.5 Microsoft Visual InterDev 6.0
  2.9.6 Conclusion of Development Tools Consideration
2.10 Scripting Languages Consideration
2.11 Browser Consideration

3.0 SYSTEM ANALYSIS
  3.1 Methodology
  3.2 Project Schedule
  3.3 Requirements Analysis
    3.3.1 Functional Requirements
      3.3.1.1 Students & Administrators Login Function
      3.3.1.2 Change Password Function
      3.3.1.3 Payment Calculating Function
      3.3.1.4 Data Transaction
      3.3.1.5 Data Queries
    3.3.2 Non-Functional Requirements
      3.3.2.1 User Interface
      3.3.2.2 Storage Capacity
      3.3.2.3 Easy to Use and Understand
      3.3.2.4 Reliable
      3.3.2.5 Robust
  3.4 Run-Time Requirements
    3.4.1 Window 95/98/2000/ME
  3.5 Data Flow Diagram

4.0 SYSTEM DESIGN
  4.1 Detail Design
    4.1.1 Architectural Design
    4.1.2 System Architecture
      4.1.2.1 Data Architecture
      4.1.2.2 Application Architecture
        a) Main page module
        b) Student login module
        c) Student change password module
        d) Student’s personal information list module
        e) Course selections module
        f) Course selected module
g) Fees payment module 55
h) Timetable module 55
i) Administrator login module 55
j) Administrator change password module 55
k) View students’ information module 56
l) Edit menu module 56
m) Edit students’ information module 56
n) Edit administrators’ information module 56
o) Edit registration fee and exam fee module 57
p) Edit MIT course information module 57
q) Edit MSE course information module 57
r) Edit MCS course information module 57
s) Edit MLIS course information module 57
t) Edit PHD course information module 57
u) Students access list module 58
v) Administrators access list module 58
w) Course registration reports module 58

4.1.3 Database Design 58
   4.1.3.1 E-R Model 58
   4.1.3.2 Data Dictionary 60

4.1.4 User Interface Design 64
   4.1.4.1 Principles of Interface Design 65
   4.1.4.2 Main Page Design 67
   4.1.4.3 Course Registration Pages Design 68
   4.1.4.4 Time Table Design 76
   4.1.4.5 Administrators Pages Design 77

5.0 SYSTEM TESTING AND IMPLEMENTATION 97

5.1 Testing Strategies 97
   5.1.1 Unit Testing 98
   5.1.2 Module Testing 99
   5.1.3 System Testing 100

5.2 System Testing 100
   5.2.1 Main page module testing 101
   5.2.2 Student login module testing 101
   5.2.3 Student change password module testing 102
   5.2.4 Student’s personal information list module testing 102
   5.2.5 Course selections module testing 102
   5.2.6 Course selected module testing 102
   5.2.7 Fees payment module testing 103
   5.2.8 Timetable module testing 103
   5.2.9 Administrator login module testing 103
5.2.10 Administrator change password module testing
5.2.11 View students' information module testing
5.2.12 Edit menu module testing
5.2.13 Edit students' information module testing
5.2.14 Edit administrators' information module testing
5.2.15 Edit registration fee and exam fee module testing
5.2.16 Edit MIT course information module testing
5.2.17 Edit MSE course information module testing
5.2.18 Edit MCS course information module testing
5.2.19 Edit MLIS course information module testing
5.2.20 Edit PHD course information module testing
5.2.21 Students access list module
5.2.22 Administrators access list module
5.2.23 Course registration reports module

5.3 System Implementation

5.3.1 Online Postgraduate Course Registration and Payment System Main Page
5.3.2 Course Registration
   - 5.3.2.1 Change Password
   - 5.3.2.2 Student Login
   - 5.3.2.3 Student Personal Information
   - 5.3.2.4 Course Selections
   - 5.3.2.5 Selected Course(s)
   - 5.3.2.6 Payment
5.3.3 Time Table
5.3.4 Administrator Login
   - 5.3.4.1 Change Password
   - 5.3.4.2 Administrator Login
   - 5.3.4.3 View Student's Record
   - 5.3.4.4 Edit Menu
      - 5.3.4.4.1 Edit Students' Information
      - 5.3.4.4.2 Edit Administrators' Information
      - 5.3.4.4.3 Edit Registration Fee and Examination Fee
      - 5.3.4.4.4 Edit MIT Course Info/ Edit MSE Course Info/ Edit MCS Course Info/ Edit MLIS Course Info/ Edit PHD Course Info
5.3.4.5 Students Access List
5.3.4.6 Administrators Access List
5.3.4.7 Course Registration Report
6.0 SYSTEM EVALUATIONS AND CONCLUSIONS

6.1 Strengths
   6.1.1 Simple and Easy to Maintain
   6.1.2 Low Cost of Ownership
   6.1.3 High Level of Upgrade
   6.1.4 Navigation of the System

6.2 Limitations
   6.2.1 Stability
   6.2.2 Low Recoverability of Stored Data
   6.2.3 Manual Backup of Database
   6.2.4 Storage Capability
   6.2.5 Interface Design
   6.2.6 Security

6.3 Future Enhancements to Upgrade the Quality of the System
   6.3.1 Security Features
   6.3.2 Designing and Deploying Web-Enabled Applications: A Changing Architecture for Changing Needs
   6.3.3 Good Quality of Performance Database Server
   6.3.4 Stable Web Server
   6.3.5 Implement Firewall
   6.3.6 Cisco

6.4 Conclusion

GLOSSARY

REFERENCES
LIST OF FIGURES

Figure 1 When accessing database information from a Web browser, the Web Server acts as the client to the database server 18
Figure 2 Prototyping Method 38
Figure 3 Context Level Diagram For An Online Postgraduate Course Registration and Payment System 46
Figure 4 Diagram 0 For An Online Postgraduate Course Registration And Payment System 48
Figure 5 Diagram 0 (Continue) 49
Figure 6 E-R Diagram for Online Postgraduate Course Registration And Payment System 59
Figure 7 Main Page Design 67
Figure 8 Student Login Page Design 68
Figure 9 Change Password Page Design 69
Figure 10 Successful Login Page Design 70
Figure 11 Student Personal Information List Page Design 71
Figure 12 Course Selections Page Design 72
Figure 13 (Continue from Figure 12) 73
Figure 14 Selected Course(s) Page Design 74
Figure 15 Payment Page Design 75
Figure 16 Timetable Selections Page Design 76
Figure 17 MCS Time Table Page Design 77
Figure 18 Administrator Login Page Design 78
Figure 19 Successful Login Page Design 79
Figure 20 View Student’ Record Page Design 80
Figure 21 Student’s Record Page Design 81
Figure 22 Edit Menu Page Design 82
Figure 23 Edit Student’s Record Page Design 83
Figure 24 Student’s Record Page Design 84
Figure 25 Add New Student Page Design 85
Figure 26 Edit Administrators’ Records Page Design 86
Figure 27 Edit/Update Record Page Design 87
Figure 28 Edit Registration Fee and Examination Fee Page Design 88
Figure 29 Edit MIT Course Page Design 89
Figure 30 (Continue from Figure 29) 90
Figure 31 Update Course Information Page Design 91
Figure 32 Students’ Login Time 92
Figure 33 Administrators’ Login Time 93
Figure 34 Course Registration Report for FSKTM 94
Figure 35 Report for MCS 95
Figure 36 Students that Register Course WRGA6302 96
Figure 37: Online Postgraduate Course Registration and Payment
System Main Page
Figure 38: Student Login
Figure 39: Change Password
Figure 40: Password Successfully Changed
Figure 41: Student Login Page
Figure 42: Successful Login
Figure 43: Student Personal Information List
Figure 44: Course Selections
Figure 45: (Continue from Figure 44)
Figure 46: Selected Course(s)
Figure 47: Payment Information
Figure 48: Time Table
Figure 49: Time Table for Master of Computer Science
Figure 50: Administrator Login
Figure 51: Administrator Login
Figure 52: Successful Login
Figure 53: View Student’s Record
Figure 54: Student’s Record
Figure 55: Edit Menu
Figure 56: Edit Student’s Record
Figure 57: Student’s Record
Figure 58: Add New Student
Figure 59: Administrators’ Records
Figure 60: Edit/Update Record
Figure 61: Edit Registration Fee and Examination Fee
Figure 62: Edit MIT Course
Figure 63: (Continue from Figure 62)
Figure 64: Edit Course Information
Figure 65: Students Login Time
Figure 66: Administrators Login Time
Figure 67: Course Registration Report for FSKTM
Figure 68: Report for MCS
Figure 69: Students that Register Course WRGA6302
Figure 70 The evolution of Web architecture to support the basic needs
Of a Web-enabled application
LIST OF TABLES

Table 1 Project Schedule 40
Table 2 UM Administrators Information 60
Table 3 FSKTM Postgraduate Students Information 61
Table 4 Courses Particulars 61
Table 5 Course(s) Selected Information and Payment Information 62
Table 6 Registration Fee & Examination Fee Per Credit Hour 63
Table 7 Students’ Login Time 63
Table 8 Administrators’ Login Time 64