

System Requirement Specifications (SRS)

1 Table of Contents

| | | |
|-------|--|----|
| 1 | Table of Contents | 1 |
| 2 | Problem Statement | 2 |
| 3 | Overview | 2 |
| 3.1 | Background | 2 |
| 3.2 | Overall Description | 2 |
| 4 | Investigation & Analysis Methodology | 2 |
| 4.1 | System Investigation | 2 |
| 4.2 | Analysis Methodology | 3 |
| 4.2.1 | Feasibility study and requirements elicitation | 3 |
| 4.2.2 | System analysis and requirements specification | 3 |
| 4.2.3 | Object-oriented design using UML | 3 |
| 4.2.4 | Prototyping | 4 |
| 5 | Constraints | 4 |
| 5.1 | Scalability | 4 |
| 5.2 | Data and Function Mapping | 4 |
| 5.3 | Proprietary hardware and software | 4 |
| 5.4 | Batch updates vs. (close) Real-time updates | 4 |
| 5.5 | Project Schedule | 5 |
| 6 | Operational Requirements | 5 |
| 6.1 | Help Desk Support | 5 |
| 6.2 | Application Services and Technical support | 5 |
| 6.3 | Administration Features | 5 |
| 6.4 | System Interface independent of VRU | 5 |
| 6.5 | System hardware fail over and routine back up | 5 |
| 6.6 | Audit Trail | 5 |
| 7 | Functional Requirements | 5 |
| 7.1 | Student Self-service | 6 |
| 7.1.1 | Personal Profile | 6 |
| 7.1.2 | Registration | 6 |
| 7.1.3 | Grades | 6 |
| 7.1.4 | Registration Assistance | 6 |
| 8 | Input Requirements | 6 |
| 8.1 | Student identifier key and user access | 6 |
| 8.2 | Course code | 6 |
| 8.3 | Action Codes | 7 |
| 9 | Process Requirements | 7 |
| 9.1 | DB2 transaction | 7 |
| 9.2 | Data integrity | 7 |
| 9.3 | Data validation | 7 |
| 9.4 | Performance | 7 |
| 9.5 | Data repository | 7 |
| 9.5.1 | Class view | 8 |
| 9.5.2 | Activity Diagram | 9 |
| 10 | Output Requirements | 9 |
| 10.1 | Transaction summary and confirmation | 9 |
| 10.2 | Exception reports | 9 |
| 10.3 | Registration Reports and summaries | 10 |
| 11 | Hardware Requirements | 10 |
| 11.1 | Network | 10 |
| 11.2 | Client Computers | 10 |
| 11.3 | IBM Mainframe | 10 |
| 11.4 | Production support systems | 10 |
| 12 | Software Requirements | 10 |
| 12.1 | Client Operating Systems | 10 |

| | | |
|------|-------------------------------|----|
| 12.2 | Client Application | 10 |
| 12.3 | Network system..... | 10 |
| 12.4 | Mainframe system | 11 |
| 12.5 | Licenses..... | 11 |
| 13 | Deployment Requirements | 11 |

2 Problem Statement

The university student registration system is unable to cope with the high volume of telephone calls received at registration time. Among others, busy signals and long distance charges are inherent problems of the telephone registration system. An online student registration system needs to be developed. In addition, students on campus, off campus, in-state, out of state, and out of country can easily and inexpensively take advantage of many of the services provided by the Office of the Registrar, which today require users to be on campus during business hours.

3 Overview

3.1 Background

As the student population of RGP University grows over time, the volume of student registration and manual process of recording, retrieving and updating each record is getting to be tremendously tedious. Routine student and faculty inquiries cannot be readily answered over the phone using the existing Voice Registration Unit (VRU) system. Conflicts in student registration records and schedule have to be manually attended by registration office personnel when the VRU system is down. During peak transaction times for each new semester, registration lines are getting longer as well as each student's waiting and processing time.

With the current process involved and the mounting frustrations and complaints from students, faculty and university personnel alike, there is an urgent need to develop the university's online registration system.

3.2 Overall Description

In essence the VRU system provides the interface to the main registration database system. Though the back-end database can reliably accommodate concurrent transactional demands, the VRU system is limited in functioning as such.

The main registration system is mainframe based DB2 version 7, which has nightly tape back-ups and fail-over system in place. Among others, other systems of the RGP University like Student Grading System, Financial Aid, and Bursar Systems are on the same DB2 platform.

4 Investigation & Analysis Methodology

4.1 System Investigation

The VRU registration system processes telephone registration transaction by matching the entered telephone numeric keys to stored transaction equivalents. The telephone numeric key to transaction mapping information is stored in a flat file in the VRU server's file system. Recorded transaction values are stored in transaction flat files that are created by the VRU system for each transaction. The transactions are then transmitted to the main registration system in mainframe DB2 for database updates after which a transaction indicator is sent back to VRU to indicate the transaction status (success or failure). Subsequently, an appropriate feedback is then sent back to the caller through a corresponding pre-recorded voice message.

4.2 Analysis Methodology

4.2.1 Feasibility study and requirements elicitation

Organize a development and implementation team composed of people knowledgeable about the current registration processes with which regular meetings will be held. A series of interviews with the managers and the developers of the current telephone registration system will be arranged. Interview and feedback from the personnel and staff working directly with the telephone system is needed to define the current environment and future system requirements. A Feasibility and Risk Assessment study will be conducted to determine which solution(s) are most appropriate based upon the results of the interviews.

4.2.2 System analysis and requirements specification

4.2.2.1 Perform an analysis of the problem using object-oriented techniques

An external view of the enterprise model of the student registration including student records, department and staff information, course requirements, and class schedules will be developed using Unified Modeling Language (UML). This System Requirement Specifications documents will form part of the documentation for the project. Some desired features of the new system include:

- The ability to search/view course offerings on-line
- Provide transcripts on-line
- Evaluate prerequisites for courses against student records
- Inform students of registration stops and provide ability to resolve and registration conflict(s)
- Allow students to fill out applications for graduation and plans of study.

4.2.2.2 Scope and Limitations

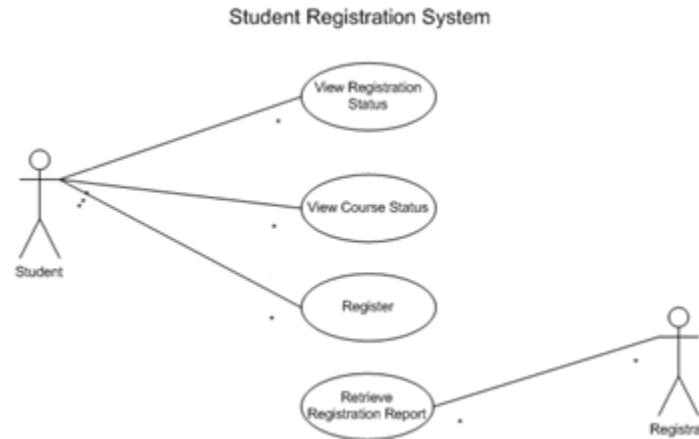
Analysis methodology will involve business analysis, requirement analysis, data analysis, process analysis, (web) and application architecture:

- Business analysis – State the business rules, business system interfaces, business function, business ownership, sponsorship and associated project budget requirement
- Requirement analysis – System I/O description, user requirement definition, functional and security requirement
- Data analysis – Involve data collection process, data validation, data storage, manipulation and retrieval
- Process analysis – Data/process flow analysis, process decomposition and system interfaces
- Application architecture – Analyze application information structure, usability, user interface design, interaction and application implementation.

4.2.3 Object-oriented design using UML

A detailed object-oriented design for the registration system will be developed. UML will be used again for the graphical representation and documentation of the design. The system will primarily concern itself with the registration process. At its core, a student will fill out or answer a web based form that will be processed in near real time by the host DB2 back-end system. In addition, the system will allow students to check waiting lists, and course capacities, and provide feedback regarding current enrollments. The system will be secured with a student's ID and password/PIN.

4.2.3.1 Use Case 1



4.2.4 Prototyping

The Object Oriented Rapid Prototyping (OORP) method will be used to implement a limited and functional prototype for the registration system. The prototype will be a working example of part of the system for demonstration and proof of concept purposes only. It will include web-based forms as an end-user interface with the DB2 database. The prototype will be presented to the implementation team.

5 Constraints

5.1 Scalability

The VRU system does not scale well to increasing system demands. VRU's underlying operating system was not designed to handle and resolve concurrent transactions. Error handling is also limited to few anticipated or common errors.

5.2 Data and Function Mapping

A new function added to the mainframe based registration system cannot be readily mapped to the existing VRU system. For example, a new course added to the mainframe based registration system will require a source code change and recompilation of the main VRU program.

5.3 Proprietary hardware and software

VRU system requires proprietary hardware and software from Call Center Technology in order to be operational.

5.4 Batch updates vs. (close) Real-time updates

There is no real-time update of mainframe DB2 registration system data for transactions thru the VRU system. Accumulated transaction records are applied overnight via a scheduled job.

5.5 Project Schedule

There is a six-month timeframe to implement a production system of an online registration system from project commencement in time for Fall 2004 registration.

6 Operational Requirements

6.1 Help Desk Support

System users have a 24x7 access to telephone assistance for questions that are technical in nature, such as, slow or sluggish system response time, incompatible browser features, application errors, system downtime inquiries, account lock-out assistance, etc.

6.2 Application Services and Technical support

Programmers and application developers will have access to source code to address bugs or system enhancements as deemed necessary. Network Administrator and DBA support is also required to maintain a 24x7 system uptime.

6.3 Administration Features

System security and access levels are provided in the online system. There are varying levels of system access and functional authority. Each student's access is limited to his/her own registration records. Only authorized system administrator(s) has access to all student registration records.

6.4 System Interface independent of VRU

The VRU system will remain operational and its functionality will be complementary but independent from the online registration system. At any one time, students may use either the VRU system or the online system only, but not both. The online system will be operational even if the VRU system is offline and vice-versa.

6.5 System hardware fail over and routine back up

Computer operations center will handle system hardware tasks such as data tape back-up, hardware maintenance, fail over, scheduled system patches and maintenance.

6.6 Audit Trail

System audit trails are inherent part of all student registrations. Among others, all transaction records will capture what action was taken, when (time-stamp) the transaction occurred and who made the transaction.

7 Functional Requirements

The online registration system is "self-service style" system that shall initially address the student registration needs.

7.1 Student Self-service

Student can make changes to his/her courses that are about to be taken for a semester in the future. All system (browser) interfaces are based ISO accepted industry standards for the WWW. Among others the online registration system will have the following functionalities:

7.1.1 Personal Profile

- Student Address
- Student Authentication/Change PIN
- Email/Fax Address
- Stops

7.1.2 Registration

- Registration Status
- Course Status
- Student's Current Schedule
- Register for a course
- Add or drop a course
- Course Evaluation Guide
- Registration Schedule

7.1.3 Grades

- View past grades earned from each course taken up to the last completed semester.
- View and Print non-official records of grades
- Keep a cumulative count of credits finished
- Display a computed value of current GPA

7.1.4 Registration Assistance

Stop a registration request course for error conditions:

- Courses have scheduling conflict
- Course does not exist
- Course requires a prerequisite that is not met
- Course has already been registered and or completed

8 Input Requirements

8.1 Student identifier key and user access

Each student is assigned a unique identifier upon admission to the university. The student must know this. This identifying key maps to all his/her registration record information in the main registration system. Admitted and current students have their online registration accounts also enabled. Such account maybe disabled during his/her stay as a matriculated student and/or after graduation or separation from the university.

8.2 Course code

Course Codes and registration schedules will be made available through the system. It will be emailed to the students email address on record prior to the next semester to assist the student's registration plans.

8.3 Action Codes

All other action (transaction) codes such as course add/drop will be available online for reference and to assist users. These action codes will be similar to VRU's transaction codes if appropriate.

9 Process Requirements

The following are among the inherent requirements that the online registration system must be able to handle.

9.1 DB2 transaction

The system must be able to send, receive and trigger transaction to the DB2 registration database system.

9.2 Data integrity

Commit transactions that are completed and/or rollback unfinished or time-out transactions.

9.3 Data validation

Data error from the user's end and from the back-end database-processing end must be gracefully handled. There will be data validation and error-handling routines as part of the online registration system.

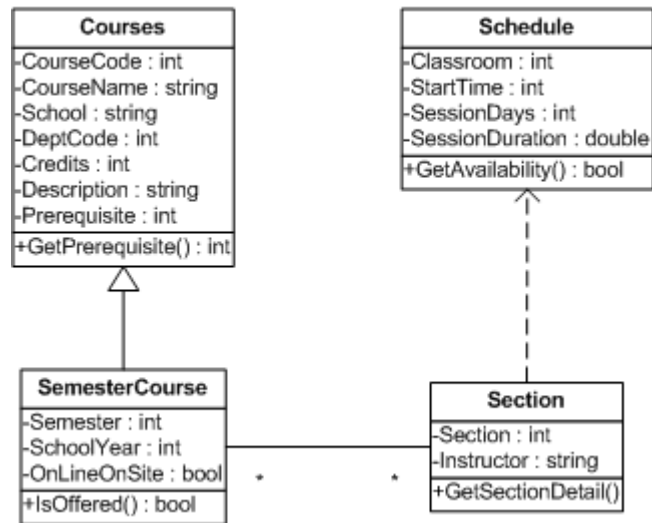
9.4 Performance

Must resolve locking issues and handle concurrent use of the system on a 24x7 basis. Send, receive and display user messages to assist the over-all user experience.

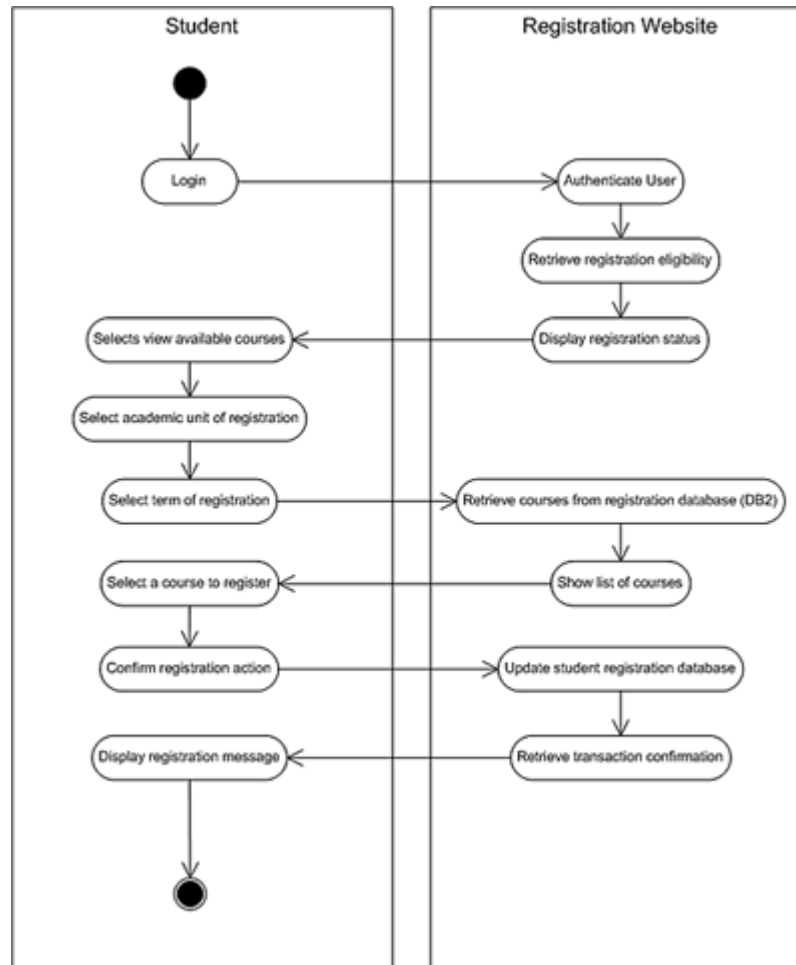
9.5 Data repository

The online registration system will maintain the existing DB2 registration database as the main repository of data.

9.5.1 Class view



9.5.2 Activity Diagram



10 Output Requirements

10.1 Transaction summary and confirmation

Each online registration user must have a view of summary of actions done for a particular session or a particular registration function. The DB2 registration database will be able to display all successfully committed transactions.

10.2 Exception reports

System exception reports must be consolidated to record special student records or special conditions not normally handled using regular registration procedures. Examples are conditionally accepted students pending completion of GMAT score, international student pending acceptance of TOEFL score, etc.

10.3 Registration Reports and summaries

Registrar and University administrators must be able to extract summarized and rolled-up data into meaningful information. All records will be archived but accessible on demand.

11 Hardware Requirements

11.1 Network

University network infrastructure (wired and wireless)

11.2 Client Computers

Mac, Unix and Windows client computers

11.3 IBM Mainframe

The environment that will host the university-wide databases

11.4 Production support systems

Web server computer(s) and related hardware support (back-up tapes, redundant drives, UPS, etc.)

12 Software Requirements

12.1 Client Operating Systems

- UNIX (any flavor)
- MAC
- Windows

12.2 Client Application

Java and Java Script compatible browser:

- Netscape
- IE
- Opera

12.3 Network system

Network software and protocols in order for systems to communicate:

- TCP/IP
- HTTP
- HTTPS
- FTP

12.4 Mainframe system

- IBM Gateway
- DB2 database

12.5 Licenses

Valid licenses are required to run software from third party vendors:

- To use application development tools
- To use web server, application server and database software in development, test and production mode

13 Deployment Requirements

