Project 2
SRS Errors Exploration

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1. Presentation format

This document describes the corrections suggested to be made to the presented document "System Requirements Specification".

Each section refers to a corresponding section in the original document.

Firstly, the initial document's paragraph of that section is quoted, underlying the errors found.

Then, in the subsection "Errors identified", a small explanation is made of the mistakes made.

Finally, a corrected version of the paragraph is suggested.

2. Other Information

In the suggested correction, we also used values like X, Y, Z, and others as a placeholder for the information that should be added and that we do not have access to.

We will also be adding a unique identifier for each requirement. Each requirement will have a prefix for the type of requirement:
- FR - Functional Requirement
- SR - System Requirement
- OPR - Operational Requirement
- IR - Input Requirement
- OUTR - Output Requirement
- PR - Process Requirement
- HR - Hardware Requirement

3. 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.
"

Errors Identified

'high volume of telephone calls' - is ambiguous, doesn't mention how many calls. It being a high or low number depends on how many people attend this university, but that information is not provided. Even if it was, a concrete number should have been given.

"Among others" - lack of specificity, every single problem should be specified.

'busy' - doesn't specify what busy actually means, there is a need for explaining to the reader the business knowledge behind the SVU system.

'long distance charges' - what is long distance, how much is this costing the students? Has also to do with ambiguity and the lack of information that helps the reader understand the problem.

'business hours' - what are the business hours?

3. Problem Statement

Example of a possible correction

The university student registration system is unable to cope with the high volume of telephone calls received at registration time. **The answering system is able to handle up to X calls at the same time and during peak registration time this value is surpassed, reaching up to Y number of calls simultaneously**. **On top of that**, busy signals, **when there are more calls than the system can handle**, and long distance charges, **only Z% of the students are within the same state and able to call free of charge while all other student's pay on average A$ per call outside of state**, 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 **(monday to friday, 9h-18h)**.

Errors Identified

'high volume of telephone calls' - is ambiguous, doesn't mention how many calls. It being a high or low number depends on how many people attend this university, but that information is not provided. Even if it was, a concrete number should have been given.

"Among others" - lack of specificity, every single problem should be specified.

'busy' - doesn't specify what busy actually means, there is a need for explaining to the reader the business knowledge behind the SVU system.

'long distance charges' - what is long distance, how much is this costing the students? Has also to do with ambiguity and the lack of information that helps the reader understand the problem.

'*business hours*' - what are the business hours?

4. Overview

4.1 Background
4.2 Overall Description

4.1 Background

"

As the student population of RGP University <u>grows over time</u>, the volume of student registration and manual process of recording, retrieving and updating each record is getting to be <u>tremendously tedious</u>. <u>Routine student and faculty inquiries</u> 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 <u>peak transaction times for each new semester</u>, <u>registration lines are getting longer</u> 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.
"

Errors Identified

'<u>grows over time</u>' - doesn't specify how much it grows, it is ambiguous.

'<u>tremendously tedious</u>' - it is subjective. Changes from person to person and doesn't say much.

'<u>Routine student and faculty inquiries</u>' - What routine inquiries? What are the students and faculty trying to inquire about?

'<u>peak transaction times for each new semester</u>' - When is this peak transaction time? It's important to know the peak transaction times to better understand the requirements.

'<u>longer</u>' - How longer? It is a good metric to know at what rate the registration lines are growing.

4.1 Background

Identification of the stakeholders

"students, faculty and university personnel alike" - In this sentence, the involved stakeholders are defined. In the following points, it is described how each of the stakeholders are impacted by the creation of the university's online registration system:

1. **Students**: Primary users of the system, directly impacted by its efficiency and effectiveness.
2. **Faculty and University Personnel**: Need access to student registration information for academic management and support.
3. **IT Department** (Developers, Network Administrators, DBAs): Responsible for system development, maintenance, and ensuring uptime.
4. **Office of the Registrar**: Manages student records and registration, directly interacts with the system for administrative tasks.
5. **Help Desk Support**: Provides technical support to users facing issues with the system.

4.1 Background

Example of a possible correction

As the student population of RGP University **(X students)** grows **at a rate of Y students per year**, the volume of student registration and manual process of recording, retrieving and updating each record is becoming **incredibly slow, taking over Z amount of seconds per request**. Routine student and faculty inquiries **(X, Y, Z)** cannot be readily answered over the phone using the existing Voice Registration Unit (VRU) system. Conflicts in student registration records and schedules have to be manually attended by registration office personnel when the VRU system is down. During peak transaction times for each new semester, **August and February, transactions reach over A per day**, registration lines are getting longer, **increasing at a rate of B students per year,** 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.

Errors Identified

'grows over time' - doesn't specify how much it grows, it is ambiguous.

'tremendously tedious' - it is subjective. Changes from person to person and doesn't say much.

'Routine student and faculty inquiries' - What routine inquiries? What are the students and faculty trying to inquire about?

'peak transaction times for each new semester' - When is this peak transaction time? It's important to know the peak transaction times to better understand the requirements.

'longer' - How longer? It is a good metric to know at what rate the registration lines are growing.

4.2 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.
"

Errors Identified

Utilization of the expression "In essence" - lack of specificity, a thorough analysis of the VRU system should have been made, not a "summarization" of it, besides being a bit subjective.

Utilization of the expression "Among others" - lack of specificity, every single system of the RGP University that are on the same DB2 platform, or none at all, since this is not critical information.

"like" - provides examples which lack specificity. There is a need to provide all of them.

4.2 Overall Description

Example of a possible correction

The VRU system provides the interface to the main registration database system, X, Y and Z. 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. **The other systems of the RGP University that are on the same DB2 platform are Student Grading System, Financial Aid, Bursar Systems, and X.**

Errors Identified

Utilization of the expression "In essence" - lack of specificity, a thorough analysis of the VRU system should have been made, not a "summarization" of it, besides being a bit subjective.

Utilization of the expression "Among others" - lack of specificity, every single system of the RGP University that are on the same DB2 platform, or none at all, since this is not critical information.

'like' - provides examples which lack specificity. There is a need to provide all of them.

5. Investigation & Analysis Methodology

5.1 System Investigation

5.2 Analysis Methodology

5.1 System Investigation

"

The VRU registration system processes telephone registration <u>transaction</u> by <u>matching the entered telephone numeric keys to stored transaction equivalents</u>. The telephone numeric key to transaction mapping information is stored in a <u>flat file</u> in the VRU server's file system. Recorded transaction values are stored in <u>transaction flat files</u> 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.
"

Errors Identified

"<u>transaction</u>" - not specified what a transaction is. Important to put in a "Definitions, Terms and Abbreviations" section as it is used multiple times over the whole document.

"<u>matching the entered telephone numeric keys to stored transaction equivalents</u>" - not specified how this matching is done.

"<u>flat file</u>" and "<u>transaction flat files</u>" - is important to point out the format on these files so the developers who read the document know what to expect.

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5.1 System Investigation

Example of a possible correction

The VRU registration system processes telephone registration transaction, **which is an operation that consists of X**, by matching the entered telephone numeric keys to stored transaction equivalents, **through the usage of Y**. The telephone numeric key to transaction mapping information is stored in a flat file in the VRU server's file system. **This flat file contains the student id and Z.** Recorded transaction values are stored in transaction flat files that are created by the VRU system for each transaction. **These transactions are stored with the transaction id, action id, and Z.** 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.

Errors Identified

"transaction" - not specified what a transaction is. Important to put in a "Definitions, Terms and Abbreviations" section as it is used multiple times over the whole document.

"matching the entered telephone numeric keys to stored transaction equivalents" - not specified how this matching is done.

"flat file" and "transaction flat files" - is important to point out the format on these files so the developers who read the document know what to expect.

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5.2 Analysis Methodology

5.2.1 Feasibility study and requirements elicitation

5.2.2 System analysis and requirements specification

5.2.3 Architecture

5.2.4 Prototyping

5.2.1 Feasibility study and requirements elicitation

"

Organize a <u>development and implementation team composed of people knowledgeable about the current registration processes</u> with which <u>regular meetings will be held</u>. A series of interviews with the managers and the developers of the current telephone registration system <u>will be arranged</u>. <u>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</u>. A Feasibility and Risk Assessment study will be conducted to determine which solution(s) are most appropriate based upon the results of the interviews.
"

Errors Identified

"<u>development and implementation team composed of people knowledgeable about the current registration processes</u>" - not specified what the exact criteria would be for the definition of this team and from where they would be, a bit too vague.

"<u>regular meetings will be held</u>" - regularity not specified, too vague.

"<u>will be arranged</u>" - will be arranged by who and when? Too vague.

"<u>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</u>" - does not specify how this feedback will be collected.

5.2.1 Feasibility study and requirements elicitation

Example of a possible correction

Organize a development and implementation team composed of people knowledgeable about the current registration processes with which regular meetings will be held. **The people appointed for this team will be selected based on their expertise on X. They all must be a part of the Z (identification of profession). Their meeting will be held weekly, on a date to be defined based on each member's availability to do so.** A series of interviews with the managers and the developers of the current telephone registration system **will take place from A to B, on the place C, arranged by D**. 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. **This feedback will be collected by conducting a X, in which the parameters Y will be asked about and accessed.** A Feasibility and Risk Assessment study will be conducted to determine which solution(s) are most appropriate based upon the results of the interviews.

Errors Identified

"development and implementation team composed of people knowledgeable about the current registration processes" - not specified what the exact criteria would be for the definition of this team and from where they would be, a bit too vague.

"regular meetings will be held" - regularity not specified, too vague.

"will be arranged" - will be arranged by who and when? Too vague.

"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" - does not specify how this feedback will be collected.

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5.2.2 System analysis and requirements specification

5.2.2.1 Perform an analysis of the problem using object-oriented techniques
5.2.2.2 Scope and Limitations

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

"

An external view of the enterprise model of the student registration <u>including</u> 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. <u>Some</u> 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*
- *<u>Inform</u> students of registration stops and <u>provide ability</u> to resolve <u>and registration conflict(s)</u>*
- *Allow students to fill out applications for graduation and plans of study.*

"

Errors Identified

Each point made should have an unique identifier.

"<u>including</u>" - not specific, should specify everything that the external view of the enterprise model of the student registration

"<u>Some</u>" - it is not specific. In a requirements document we cannot have partial information.

"<u>provide ability</u>" - Provide ability in what sense? It is ambiguous.

"<u>Inform</u>" - Inform how? It is ambiguous.

"<u>and registration conflict(s)</u>" - This sentence is confusing and poorly worded. The *"and"* was probably added accidentally. Besides this, it is vague, the conflicts should be specified.

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

Example of a possible correction

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

SR1. The system will allow the user to search course offerings on-line.
SR2. The system will allow the user to view course offerings on-line.
SR3. The system will allow the user to provide transcripts on-line.
SR4. The system will evaluate prerequisites for courses against student records.
SR5. The system will inform students of registration stops **through the use of notifications.**
SR6. The system will provide the ability to **resolve registration conflicts through Z**.
SR7. The system will allow the user to fill out applications for graduation and plans of study.

Errors Identified

Each point made should have an unique identifier.

"including" - not specific, should specify everything that the external view of the enterprise model of the student registration

"Some" - it is not specific. In a requirements document we cannot have partial information.

"provide ability" - Provide ability in what sense? It is ambiguous.

"Inform" - Inform how? It is ambiguous.

"and registration conflict(s)" - phrase is confusing.. not easy to understand

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5.2.2.2 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.*

"

Errors Identified

We didn't identify any errors with this section.

5.2.3 Architecture

5.2.3.1 Use case 1

5.2.3.2 Use case 2

5.2.3 Architecture

Title changed due to the fact that the previous title ("Object-oriented design using UML") is a synonym of Architecture.

"

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. <u>The system will primarily concern itself with the registration process</u>. At its core, a student will <u>fill out or answer</u> a web based form that will be processed in <u>near real time</u> 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 <u>student's ID and password/PIN</u>.

"

Errors Identified

"<u>The system will primarily concern itself with the registration process</u>" - Every part of the system has to be addressed equality and the documentation can't skip over information that is not the "primary focus". Furthermore, the use cases below should also take into account the other parts of the system, such as, student management (creating student unique ids, disabling their accounts, etc).

"<u>fill out or answer</u>" - Either one or the other. We need to be concise, so there is no need for both terms.

"<u>near real time</u>" - It is ambiguous. We need a clear goal.

"<u>student's ID and password/PIN</u>" - Doesn't specify when/how the password is defined.

5.2.3 Architecture

Example of a possible correction

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 concern itself with the registration process, as well as, X and Y**. At its core, a student will **fill out** a web based form that will be processed in **at most 100ms** 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, **that will be defined when X through Y**.
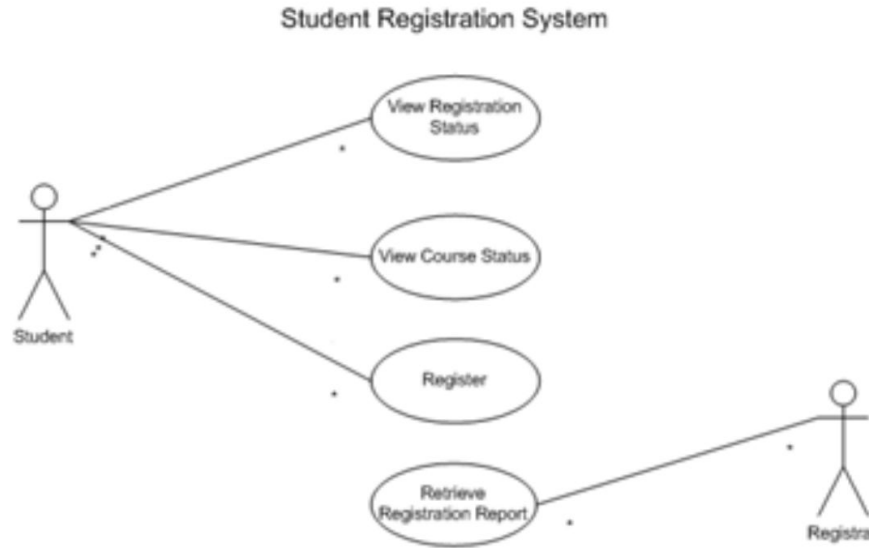
Errors Identified

"The system will primarily concern itself with the registration process" - the term "primarily concern" cannot be used in requirements documents as every part of the system has to be addressed equality and the documentation can't skip over information that is not the "primary focus". Furthermore, the use cases below should also take into account the other parts of the system, such as, student management (creating student unique ids, disabling their accounts, etc).

"fill out or answer" - It is either one or the other. We need to be concise.

"near real time" - It is ambiguous. We need a clear goal.

"student's ID and password/PIN" - doesn't specify when/how the password is defined.

5.2.3.1 Use case 1 and 5.2.3.2 Use case 2

Errors Identified

The presented diagram actually represents more than a single use case. For that, the title should be changed from "Use case 1" to "Use cases".

Example of a possible correction

For that, the title should be changed from "Use Case 1" to "Use Cases" and the different use cases should have a diagram of their own.

5.2.4 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 <u>part of the system</u> 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.

"

Errors Identified

"<u>part of the system</u>" - which part of the system? Very vague.

Doesn't mention when the prototype is supposed to be ready. In what phase of the project will it be presented?

5.2.4 Prototyping

Example of a possible correction

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 the **registration status, the course status, registration of courses and the retrieval of registration report** 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 **and should be ready by X**.

Errors Identified

"part of the system" - which part of the system? Very vague.

Doesn't mention when the prototype is supposed to be ready. In what phase of the project will it be presented?

6. Constraints

6.1 Scalability

6.2 Data and Function Mapping

6.3 Proprietary hardware and software

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

6.5 Project Schedule

6.1 Scalability

"

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

Errors Identified

"<u>*increasing system demands*</u>" - The demands should be specified, for example mentioning how much the system can scale without errors, etc.

"<u>few anticipated or common errors</u>" - which errors?

6.1 Scalability

Example of a possible correction

The VRU system does not scale well to the increase of the following system demands:

6.1.1. X

6.1.2. Y

VRU's underlying operating system was not designed to handle and resolve concurrent transactions. Error handling is also limited to **these anticipated and common errors: Error1, Error2, Error3 and Error4**.

Errors Identified

"_increasing system demands_" - The demands should be specified, for example mentioning how much the system can scale without errors, etc.

"few anticipated or common errors" - which errors?

6.2 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.
"

Errors Identified

No errors were identified in this section of the document.

6.3 Proprietary hardware and software

"

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

Errors Identified

"*requires proprietary hardware and software*"
- Does not specify which hardware and software is needed.

6.3 Proprietary hardware and software

Example of a possible correction

VRU system requires proprietary hardware and software from Call Center Technology in order to be operational. **The proprietary hardware needed is X and Y. The proprietary software needed is Z.**

Errors Identified

"_requires proprietary hardware and software_"
- does not specify which hardware and software is needed.

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6.4 Batch updates vs (close) Real-time updates

"

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

"

Errors Identified

"<u>thru</u>" - Informal English should not be used.

"<u>scheduled job</u>" - Should specify more about the definitions of the scheduled job and the technology to be used.

6.4 Batch updates vs (close) Real-time updates

Example of a possible correction

There is no real-time update of mainframe DB2 registration system data for transactions **through** the VRU system. Accumulated transaction records are applied overnight via a scheduled job that **was defined to do X and Y every Z at A**.

Errors Identified

"thru" - Informal English should not be used.

"scheduled job" - Should specify more about the definitions of the scheduled job and the technology to be used.

6.5 Project Schedule

"

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

Errors Identified

"<u>six-month timeframe</u>" - Even though we know that the system needs to be ready for the Fall 2004 registration, we don't know when the registration for the fall starts.

6.5 Project Schedule

Example of a possible correction

Errors Identified

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

"<u>six-month timeframe</u>" - even though we know that the system needs to be ready for the Fall 2004 registration, we don't know when the registration for the fall starts.

7. Operational Requirements

7.1 Help Desk Support

7.2 Application Services and Technical support

7.3 Administration Features

7.4 System Interface independent of VRU

7.5 System hardware fail over and routine backup

7.6 Audit Trail

7.1 Help Desk Support

"

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

Errors Identified

"<u>24x7</u>" - Informal language should not be used. Since 24x7 essentially means always, this also implies totality, which should be avoided.

"<u>such as</u>" - This expression is vague since the situation (telephone assistance) is unpredictable.

"<u>etc.</u>" - Same justification as the *"such as"* error.

Example of a possible correction

SR8. System users have access to telephone assistance for **technical questions X% of the time**.

7.2 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.
"

Errors Identified

"Programmers and application developers" - should be two different requirements; the stakeholders could have been mentioned before.

"*will have access*" - how will this access be given? Should be more specific.

"system enhancements" - It would be important to explain how these enhancements will be carried out.

"Network Administrator and DBA" - should be two different requirements

"24x7" - Informal language should not be used. Also it's impossible to have a system running for 24 hours a day, 7 days a week.

"as deemed necessary" - Loophole, what's deemed necessary has to be planned and described.

7.2 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.

"

Example of a possible correction

SR9.   Programmers will have access to source code to address bugs or system enhancements.

SR10.   Application developers will have access to source code to address bugs or system enhancements.

SR11.   Addressing bugs and system enhancements will be done through the use of Z using the methods of W. The access will be given through X.

SR12.   Network Administrator is required to maintain a minimum system uptime of X.

SR13.   DBA support is also required to maintain a minimum system uptime of X.

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7.3 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.
"

Errors Identified

"*System security and access levels* " - should have specified the different security and access levels.

"*There are varying levels of system access and functional authority*" - all levels of system access and functional authority should have been specified.

"*registration records*" - what registration records, what information do these records contain?

"*Only authorized system administrator(s) has*" - incorrect English should not be used. The verb 'has' is not being correctly used.

The paragraph enumerates the different levels of system access and functional authority. This should be in different unique identifiers.

7.3 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.

"

Example of a possible correction

SR14.   Students will have registration records
    SR14.1.   Registration Records will contain the students' X information
    SR14.2.   Registration Records will contain the students' Y information

SR15.   The security system should provide different security levels
    SR15.1.   The security system should provide security level 1 where X
    SR15.2.   The security system should provide security level 2 where Y

SR16.   The security system should provide different access levels
    SR16.1.   The security system should provide access level 1 for students
        SR16.1.1.   Students can access their only registration records
        SR16.1.2.   Students can't access other students' registration records
    SR16.2.   The security system should provide access level 1 for system administrators
        SR16.2.1.   System administrators can access all student registration records
        SR16.2.2.   System administrators can access feature X

7.4 System Interface independent of VRU

"

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

"

Errors Identified

"<u>remain operational</u>" - specify how the system will remain operational.

"<u>*complementary but independent*</u>"- specify how the system complements the online registration system and the aspects that make it independent from it.

"<u>*VRU system or the online system only, but not both*</u>" - would be important to specify why it isn't possible, so that nobody involved   doesn't have to make assumptions.

"<u>and vice-versa</u>" - should be separated into another sentence.

7.4 System Interface independent of VRU

"

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

"

Example of a possible correction

OPR10.   The VRU system will remain operational X% of the time.

OPR11.   The VRU system will be complementary to the online registration system by doing Y.

OPR12.   At any one time, students may use either the VRU system or the online system only, but not both, due to the Z.

OPR13.   The online system will be operational even if the VRU system is offline.

OPR14.   The VRU system will be operational even if the online system is offline.

7.5 System Hardware fail over and routine backup

"

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

Errors Identified

"*Computer operations center*" - who does it? Where is it done? Is there a back office?

"*such as*" - vague, could imply more tasks not mentioned. Should list all possible system hardware tasks that the computer operations center should be able to handle.

"*data tape back-up, hardware maintenance, fail over, scheduled system patches and maintenance*" - should specify how each of these tasks will be done.

7.5 System Hardware fail over and routine backup

"

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

Example of a possible correction

OR15. Computer operations center will handle system hardware tasks

    OR15.1.   Computer operations center will handle data tape back-up

    OR15.2.   Computer operations center will handle failover

    OR15.3.   Computer operations center will handle scheduled system patches

    OR15.4.   Computer operations center will handle maintenance

7.6 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.
"

Errors Identified

"*Among others*"- This expression is vague. All the information captured should be directly specified.

"transaction records" - how are these transaction records actually recorded? What is being referred to by "transaction records"?

7.6 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.
"

Example of a possible correction

OR16. The system should provide audit trails for student registrations in the form of transaction records.

OR16.1.   Transaction records will capture what action was taken.

OR16.2.   Transaction records will capture when the transaction occurred using a time-stamp.

OR16.3.   Transaction records will capture who made the transaction.

8. Functional Requirements

8.1 Services available to students

     8.1.1 Personal profile

     8.1.2 Registration

     8.1.3 Grades

     8.1.4 Registration Assistance

8. Functional Requirements

"

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

Errors Identified

"*is "self-service style"*"- The grammar in this expression isn't correct. The use of quotes also implies that the definition of a self-service style system is vague or not well defined.

"*initially address the student registration needs*" - what is meant by initially? What registration needs in specific? Up until what point does this "self-service style system" address the student's needs?

Example of a possible correction

The online registration system **is a service that provides the students with the ability to execute the tasks X, Y and Z** that shall address the student registration needs **X, Y and Z, respectively.**

8.1 Services available to students

8.1.1 Personal profile

8.1.2 Registration

8.1.3 Grades

8.1.4 Registration Assistance

8.1 Services Available to Students (previously 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:
"

Errors Identified

"*Student* " - Improper grammar use, should be plural.

"*changes to his/her courses*" - in what sense? The reader has to suppose that the writer meant the adding and dropping of courses.

"*All system (browser) interfaces*" - Implies totality. Should specify which system interfaces will be used.

"*are based ISO accepted industry standards*"- This expression is vague, as it doesn't specify which ISO standard shall be used in the browser interfaces.

"*Among others*"- *it's* vague, can imply that there are more functionalities not mentioned. It should list all functionalities that encompass the online registration system.

"*re about to be taken for a semester in the future*" - the utilization of the indefinite article "a" makes it not obvious if it is referring to only one semester in the future or more.

8.1 Services Available to Students (previously Student self-service)

Example of a possible correction

FR1. Students will be able to make changes to the courses they are about to take for one semester in the future.
   FR1.1.   Students will be able to add a course.
   FR1.2.   Students will be able to remove a course.
FR2. The system should work on the X browser interface (version X and above) by following the ISO accepted industry standards for the W.
FR3. The system should work on the Y browser interface (version Y and above) by following the ISO accepted industry standards for the W.
FR4. The system should work on the Z browser interface (version Z and above) by following the ISO accepted industry standards for the W.
FR5. The online registration system will have different pages, one for each functionality.

8.1.1 Personal Profile

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

Errors Identified

"Student Address" - the address should appear in the personal profile. It is weird that the user can't change his address.

"Student Authentication/Change PIN" - There is a correlation between these, but changing the pin and authentication are two different things, so they should be different requirements.

"Email/Fax Address" - Email and Fax Address don't follow the same structure. The system can either have both or choose one of them, either way, this should be more clear.

 "Stops" - No information about what this is. There should be a definitions, terms and abbreviations section in the document. The only possible information we found online was this:

- STOPS (Software for Target-Oriented Personal Syllabus) is a tool that allows university students to create personal study plans and the staff to maintain and develop course contents and curriculum structure

The phrase that introduces this section implies that functionalities will be presented. This section and the following ones list aspects of the system that aren't functionalities.

8.1.1 Personal Profile

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

Example of a possible correction

FR6. The student's personal profile should have their Address.

FR7. The system should allow the student to authenticate using Email and PIN.

FR8. The student should be able to change their PIN.

FR9. The student's personal profile should have their Email.

FR10. The student's personal profile should have their Fax address.

8.1.2 Registration

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

Errors Identified

"Registration Status" - Which statuses exist? This should be specified.

"Course Status" - Ambiguous naming. Again, which statuses exist, which courses?

"Student's Current Schedule" - Doesn't say what information each class should have. Doesn't specify which days of the week, nor the hours on the Y axis of the schedule.

"Register for a course" - Shouldn't the user be able to see which courses exist? What information does the student need to provide to do it? Can a student sign up to any course? What is the flow (is there a request phase before joining the course)? All this information should be specified.

"Add or drop a course" - Should be two requirements. What is the difference between Add and Register? The same word course is used in both cases, making it ambiguous, since it could be Bachelor's/Master's Degree or curricular unit. This could be specified in a vocabulary section. Can a student just add/drop a course? The flow should also be specified.

"*Course Evaluation Guide*" - What is being evaluated and how it is being done should be specified. Where is this information stored? Course or Course Unit?

"*Registration Schedule*" - It may be assumed that this meant the dates for when the student's need to register their courses but it is not explicitly stated.

8.1.2 Registration

"

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

"

Example of a possible correction

FR11.   Students should be able to see their registration status
  FR11.1.   The registration status A indicates X
  FR11.2.   The registration status B indicates Y
FR12.   Students should be able to see the status of their registered courses. These are:
  FR12.1.   The course status A indicates X
  FR12.2.   The course status B indicates Y
FR13.   Students should be able to see his current schedule:
  FR13.1.   The Y axis of the schedule should show every hour from 8AM to 6PM
  FR13.2.   The X axis of the schedule should show the days from monday to friday
  FR13.3.   The events on the schedule should show the class happening at that time
    FR13.3.1.   The event should contain the course code
    FR13.3.2.   The event should contain the department code
    FR13.3.3.   The event should contain X
FR14.   Students should be able to see their Curricular Units

8.1.2 Registration

"

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

"

Example of a possible correction (continuation)

FR15.   Students should be able to see their Courses that are available for registration

FR16.   Students should be able to register for the Courses

   FR16.1.   The system should validate a student's prerequisites before course registration.

   FR16.2.   The system should validate if a course exists before course registration.

   FR16.3.   The system should validate if a course doesn't conflict with other courses in the schedule

   FR16.4.   The system should validate if a hasn't been registered yet before course registration.

FR17.   Students should be able to see the list of curricular units available.

FR18.   Students should be able to add a course unit.

FR19.   Students should be able to drop a course unit.

FR20.   Students should have access to a course evaluation guide

   FR20.1.   The evaluation guide should contain X

   FR20.2.   The evaluation guide should contain Y

FR21.   Students should have, on the Registration page, the registration opening date

FR22.   Students should have, on the Registration page, the registration deadline date.

8.1.3 Grades

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

Errors identified

<u>"View and Print non-official records of grades"</u> - Should be two different requirements. What is the format of the file? What information does it hold? What records? Once again, this information should be specified.

"<u>Display a computed value of current GPA</u>" - the formula for this computation should be defined.

8.1.3 Grades

"

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

"

Example of a possible correction

FR23.   Students should view past grades earned from each course taken up to the last completed semester.

FR24.   Students should be able to download records of grades

  FR24.1.   Students should be able to download records of grades in PDF format

  FR24.2.   Students should be able to download records of grades in CSV format

FR25.   Students should view a cumulative count of credits finished

FR26.   Students should view a computed value of current GPA. Calculated like so:

8.1.4 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

"

Errors identified

"Stop a registration request course for error conditions" - the user should get feedback when this happens and that was not addressed in the Functional Requirements.

"Course has already been registered and or completed" - Should be two different requirements. The use of and/or is also ambiguous.

8.1.4 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

"

Example of a possible correction

FR27. **The user shall get a notification with the error message.**

FR28. Stop a registration request course for error conditions.

FR28.1.	Stop a registration request course when courses have scheduling conflicts.

FR28.2.	Stop a registration request course when a course does not exist

FR28.3.	Stop a registration request course when a course requires a prerequisite that is not met.

FR28.4.	Stop a registration request course when a course has already been **registered.**

FR28.5.	Stop a registration request course when a course has already been **completed.**

9. Input Requirements

9.1 Student identifier key and user access

9.2 Course Code

9.3 Action Codes

9.1 Student identifier key and user access

"

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

"

Errors Identified

"<u>*unique identifier upon admission*</u>" - Who creates this identifier? How? What's the format? From where? Is there logic behind the identifier? How does the student have access to it? Incomplete information.

"<u>*The student must know this.*</u>" - it should be specified how the student will know this.

"<u>S*uch account maybe disabled during his/her stay as a matriculated student and/or after graduation or separation from the university.*</u>"- Improper grammar in the "maybe". Should be separated in different sections, one for each possible reason. The term "such account" is vague.

9.1 Student identifier key and user access

Example of a possible correction

IR1. Each student is assigned a unique identifier, **created by the X from the Y,** upon admission to the university.
IR2. **The unique identifier will have the following structure: Z.**
IR3. **The student will know the unique identifier through X means.**
IR4. **The unique identifier maps to all their registration record information in the main registration system.**
IR5. **Admitted students have their online registration accounts also enabled.**
IR6. **Current students have their online registration accounts also enabled.**
IR7. **Student accounts may be disabled during their stay as a matriculated student.**
IR8. **Student accounts may be disabled after graduation.**
IR9. **Student accounts may be disabled on separation from the university.**
IR10. **The enabling of accounts can be done by X (stakeholder).**
IR11. **The disabling of accounts can be done by X (stakeholder).**
IR12. **The enabling of accounts can be done in Y (page/feature).**
IR13. **The disabling of accounts can be done in Y (page/feature).**

Errors Identified

"*unique identifier upon admission*" - Who creates this identifier? How? What's the format? From where? Is there logic behind the identifier? How does the student have access to it? Incomplete information.

"*The student must know this.*" - it should be specified how the student will know this.

"S*uch account maybe disabled during his/her stay as a matriculated student and/or after graduation or separation from the university.*"- Improper grammar in the "maybe". Should be separated in different sections, one for each possible reason. The term "such account" is vague.

9.2 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.

"

Errors Identified

"*Course Codes and registration schedules*" - should be separated in two different requirements.

"*will be made available through the system*" - Vague, the next sentence could imply this means the system will send out emails, but it could also mean the system itself is able to show this information somewhere.

"*It*"- Vague, is this referring to course codes, registration schedules, both?

"*prior to the next semester*" - How much time before a semester? Should be specified.

"*emailed to the students email address* " - What if it is the student's first semester in the university? In that case, how will this email be sent, because the student's email may not yet have been provided? Or with what antecedent in that case?

9.2 Course Code

Example of a possible correction

IR1. The system will make available Course Codes **by emailing them to the students email address on record X days before the next semester.**

IR2. The system will make available registration schedules **by emailing them to the students email address on record X days before the next semester.**

IR3. **If it is the student's first semester in the university, the procedure will be doing XXX, Y days before the beginning of the semester.**

Errors Identified

"*Course Codes and registration schedules*" - should be separated in two different requirements.

"*will be made available through the system*" - Vague, the next sentence could imply this means the system will send out emails, but it could also mean the system itself is able to show this information somewhere.

"*It*"- Vague, is this referring to course codes, registration schedules, both?

"*prior to the next semester*" - How much time before a semester? Should be specified.

"*emailed to the students email address* " - What if it is the student's first semester in the university? In that case, how will this email be sent, because the student's email may not yet have been provided? Or with what antecedent in that case?

9.3 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.

"

"All other action (transaction) codes" - The term "all other" implies totality, which can become vague, so it should be specified which action codes. Besides this, it is not clear what "action codes" means, so there should be a definition on the document for this.

"such as" - This expression is very vague . All of the action codes should be explicitly written in the requirement.

"similar" - Vague, should specify the ways they should be similar

"if appropriate" - "if appropriate" is a loophole, and should be avoided.

9.3 Action Codes

Example of a possible correction

IR17. The action codes for course add will be available online for reference and to assist users.

IR18. The action codes for course drop will be available online for reference and to assist users.

IR19. The action codes for transaction X will be available online for reference and to assist users.

IR20. These action codes will be similar to VRU's transaction codes **if Y**.

Errors Identified

"All other action (transaction) codes" - The term "all other" implies totality, which can become vague, so it should be specified which action codes. Besides this, it is not clear what "action codes" means, so there should be a definition on the document for this.

"such as" - This expression is very vague . All of the action codes should be explicitly written in the requirement.

"similar" - Vague, should specify the ways they should be similar

"if appropriate" - "if appropriate" is a loophole, and should be avoided.

10. Process Requirements

10.1 DB2 transaction

10.2 Data integrity

10.3 Data validation

10.4 Performance

10.5 Data repository

      10.5.1 Class View

      10.5.2 Activity Diagram

10.1 DB2 transaction

"

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

"

Errors identified

"<u>*send, receive and trigger*</u>" - Should be multiple requirements. Besides that, how will these transactions be made? Not enough information.

"<u>*transaction*</u>" - Improper grammar, should be plural.

10.1 DB2 transaction

Example of a possible correction

PR1.   The system must be able to send **transactions** to the DB2 registration database system.
PR2.   The system must be able to receive **transactions** to the DB2 registration database system.
PR3.   The system must be able to trigger **transactions** to the DB2 registration database system.

Errors identified

"*send, receive and trigger*" - Should be multiple requirements. Besides that, how will these transactions be made? Not enough information.

"*transaction*" - Improper grammar, should be plural.

10.2 Data integrity

"

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

"

Errors Identified

"Commit transactions" - Should include who commits the transaction for clarity, in this case, the system.

"and/or rollback unfinished or time-out transactions" - Ambiguous logical statement.

10.2 Data integrity

Example of a possible correction

PR4. **The system should be able to** commit transactions that are completed.

PR5. **The system should be able to** rollback transactions that rollback unfinished.

PR6. **The system should be able to** rollback transactions that time-out.

Errors Identified

"Commit transactions" - Should include who commits the transaction for clarity, in this case, the system.

"and/or rollback unfinished or time-out transactions" - Ambiguous logical statement.

10.3 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.

"

Errors identified

"_Data error from the user's end and from the back-end database-processing_" - Should be two separate requirements.

"_gracefully handled_" - Ambiguous. What is handling gracefully?

"_data validation and error-handling routines_" - Should be two separate requirements. Since this was mentioned, there is a need to mention what is considered valid for each requirement (in the whole document).

10.3 Data validation

Example of a possible correction

PR7. Data error from the user's end must be properly handled by doing X.
PR8. Data error for the back-end database-processing must be handled by doing Y.
PR9. There will be data validation as part of the online registration system.
PR10. There will be error-handling routines as part of the online registration system.

Errors identified

"*Data error from the user's end and from the back-end database-processing*" - Should be two separate requirements.

"*gracefully handled*" - Ambiguous. What is handling gracefully?

"*data validation and error-handling routines*" - Should be two separate requirements. Since this was mentioned, there is a need to mention what is considered valid for each requirement (in the whole document).

10.4 Performance

"

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

"

"<u>resolve locking issues and handle concurrent use</u>" - This part should be separated into two. Both "resolve locking issues" and "handle concurrent use" are vague expressions. They should specify the amount of users the system can handle concurrently.

"<u>24x7</u>" - Informal language should not be used. Besides that, it is impossible for a system to be up 24 hours a day, 7 days a week. Instead, a downtime should be defined, for example.

"<u>Send, receive and display user messages</u>" - Should be separated into three different requirements. Besides that, how will these messages be sent, received and displayed? This requirement also doesn't fit well in the performance category.

"<u>over-all</u>" - Typographical error, correct word is "overall".

10.4 Performance

Example of a possible correction

PR11.   The system should have a downtime of only X% of the total time, being able to resolve:
   PR11.1.   Locking issues.
   PR11.2.   Concurrent use.
PR12.   The system should send user messages to assist the overall user experience.
PR13.   The system should receive user messages to assist the overall user experience.
PR14.   The system should display user messages to assist the overall user experience.

Errors identified

"resolve locking issues and handle concurrent use" - This part should be separated into two. Both "resolve locking issues" and "handle concurrent use" are vague expressions. They should specify the amount of users the system can handle concurrently.

"24x7" - Informal language should not be used. Besides that, it is impossible for a system to be up 24 hours a day, 7 days a week. Instead, a downtime should be defined, for example.

"Send, receive and display user messages" - Should be separated into three different requirements. Besides that, how will these messages be sent, received and displayed? This requirement also doesn't fit well in the performance category.

"over-all" - Typographical error, correct word is "overall".

10.5 Data repository

10.5.1 Class View
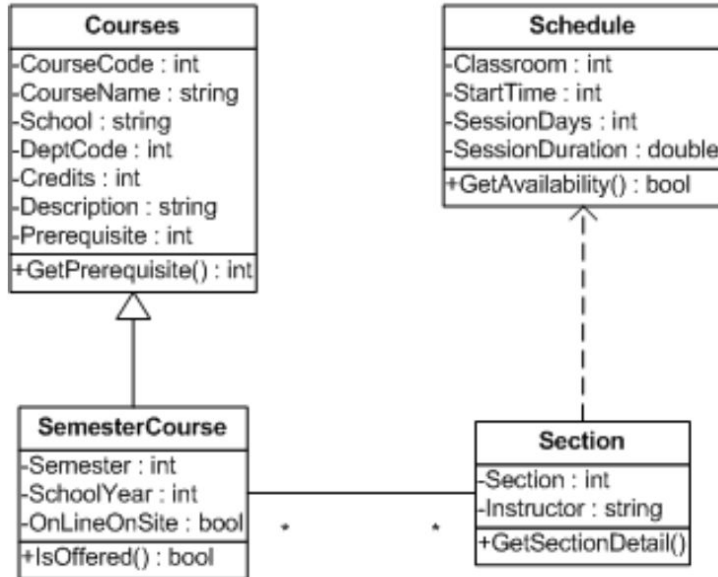
10.5.2 Activity Diagram

10.5 Data repository

"

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

"

Errors identified

No errors were identified in this section of the document.

10.5.1 Class View

10.5.2 Activity Diagram

Errors Identified

In this activity diagram there are a lot of requirements that were not mentioned prior to it. The Activity Diagram is to serve as support for the document and not to specify requirements. The requirements that haven't been specified before are:

- Retrieve registration eligibility (should be more specific that it is referring to the section 6.3 in the original document, that states that "There are varying levels of system access and functional authority.")
- Select term of registration
- Retrieve courses from registration database (DB2)
- Confirm registration action
- Update student registration database
- Retrieve transaction confirmation
- Display registration message

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10.5.2 Activity Diagram

Example of a possible correction

Include in the Functional Requirements all of the missing requirements:

FR29. A student should be able to see if he is able to register, considering their level of system access.
FR30. A student should be able to select the term of registration.
  FR30.1. The possible terms of registration are X and Y.
FR31. The student should have a view to see available courses.
FR32. The student should get a popup asking him to verify his registration.
FR33. The system should return a message to the student (in the form of a notification) when the transaction is confirmed.

Errors Identified

In this activity diagram there are a lot of requirements that were not mentioned prior to it. The Activity Diagram is to serve as support for the document and not to specify requirements. The requirements that haven't been specified before are:

- Retrieve registration eligibility (should be more specific that it is referring to the section 6.3 in the original document, that states that "There are varying levels of system access and functional authority.")
- Select term of registration
- Retrieve courses from registration database (DB2)
- Confirm registration action
- Update student registration database
- Retrieve transaction confirmation
- Display registration message

11. Output Requirements

11.1 Transaction summary and confirmation

11.2 Exception reports

11.3 Registration Reports and summaries

11.1 Transaction summary and confirmation

"

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

"

Errors Identified

"<u>view of summary of actions</u>" - Improper english. Besides that, what is considered an action? Action should be defined in a "Definitions, Terms and Abbreviations" section.

"<u>particular session or a particular registration function</u>" - Should be two separate requirements.

11.1 Transaction summary and confirmation

Example of a possible correction

OUTR1.Each online registration user must have **the possibility to view a history of actions done in each** session.

OUTR2.Each online registration user must have **the possibility to view a history of actions done in each** registration function.

OUTR3.The DB2 registration database will be able to display all successfully committed transactions.

Errors identified

"view of summary of actions" - Improper english. Besides that, what is considered an action? Action should be defined in a "Definitions, Terms and Abbreviations" section.

"particular session or a particular registration function" - Should be two separate requirements.

11.2 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.

"

Errors identified

"*Examples* " and "etc." **-** either examples should not be given or absolutely every single situation in which an exception report should be written should be discriminated against.

11.2 Exception reports

Example of a possible correction

OUTR4. The system's exception reports must be consolidated to record conditionally accepted students pending completion of GMAT score.
OUTR5. The system's exception reports must be consolidated to record international students pending acceptance of TOEFL score.
OUTR6. The system's exception reports must be consolidated to record X.

Errors identified

"*Examples* " and "etc." - either examples should not be given or absolutely every single situation in which an exception report should be written should be discriminated against.

11.3 Registration Reports and summaries

"

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

"

Errors identified

"extract summarized and rolled-up data into meaningful information" - Which summarized and roll-up data and how it should be extracted? Transform into which format? What is considered meaningful information?

11.3 Registration Reports and summaries

Example of a possible correction

OUTR7. Registrar administrators must be able to extract summarized data **from X by doing Y, transforming it to the format Z.**
OUTR8. University administrators must be able to extract summarized data **from X by doing Y, transforming it to the format Z.**
OUTR9. Registrar administrators must be able to extract rolled-up data **from X by doing Y, transforming it to the format Z.**
OUTR10. University administrators must be able to extract rolled-up data **from X by doing Y, transforming it to the format Z.**
OUTR11. **The extracted data shall be turned into:**
　　OUTR11.1. **X**
　　OUTR11.2. **Y**
　　OUTR11.3. **Z**
OUTR12. All records will be archived.
OUTR13. All records will be accessible on demand.

Errors identified

extract summarized and rolled-up data into meaningful information - which summarized and roll-up data and how it should be extracted? Transform into which format? What is considered meaningful information?

12. Hardware Requirements

12.1 Network

12.2 Client Computers

12.3 IBM Mainframe

12.4 Production support systems

12.1 Network

"

University network infrastructure (wired and wireless)

"

Errors identified

This sentence is not specific enough.

12.1 Network

Example of a possible correction

HR1. University network infrastructure must support wired connections

HR2. University network infrastructure must support wireless connections

Errors Identified

This sentence is not specific enough.

12.2 Client Computers

"

Mac, Unix and Windows client computers

"

Errors identified

This sentence is very poorly written.

12.2 Client Computers

Example of a possible correction

HR3. **The VRU computer implementation will work on Mac, versions X and above .**

HR4. **The VRU computer implementation will work on Unix, versions Y and above.**

HR5. **The VRU computer implementation will work on Windows, versions Z and above.**

Errors identified

This sentence is very poorly written.

12.3 IBM Mainframe

"

The environment that will host the university-wide databases

"

Errors identified

This section is confusing, since it is incomplete.

12.3 IBM Mainframe

Example of a possible correction

HR6. The IBM Mainframe will be the environment that will host the university-wide databases.

Errors identified

This section is confusing, since it is incomplete.

12.4 Production support systems

"

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

"

Errors identified

"etc." - Either all related hardware support is enunciated or none at all is.

"*UPS*" - Does not specify what the UPS means. There should be a section in the beginning of the document specifying every acronym specified through it.

12.4 Production support systems

Example of a possible correction

 HR7. Back-up tapes will be part of the production support system.
 HR8. Redundant drives will be part of the production support system.
 HR9. UPS will be part of the production support system.
HR10. X will be part of the production support system.

Errors identified

"etc." - Either all related hardware support is enunciated or none at all is.

"*UPS*" - Does not specify what the UPS means. There should be a section in the beginning of the document specifying every acronym specified through it.

13. Software Requirements

13.1 Client Operating Systems

13.2 Client Application

13.3 Network System

13.4 Mainframe system

13.5 Licenses

13.1 Client Operating Systems

"

- UNIX (any <u>flavor</u>)
- MAC
- Windows

"

Errors Identified

"<u>flavor</u>" **-** informal English.

Each of the points should have an unique identifier.

13.1 Client Operating Systems

Example of a possible correction

SWR1. Clients should be able to use the system with the UNIX operating system (versions X and above).

SWR2. Clients should be able to use the system with the MAC operating system (versions X and above).

SWR3. Clients should be able to use the system with the Windows operating system (versions X and above).

Errors Identified

"flavor" - informal English.

Each of the points should have an unique identifier.

13.2 Client Application

"

Java and Java Script compatible browser:

- Netscape
- IE
- Opera

"

Errors Identified

"Netscape / IE/ Opera **"** - Should present the minimal version needed.

13.2 Client Application

Example of a possible correction

SWR4. The client application should be run on the Java and JavaScript compatible browser Netscape (versions X and above).

SWR5. The client application should be run on the Java and JavaScript compatible browser IE (versions Y and above).

SWR6. The client application should be run on the Java and JavaScript compatible browser Opera (versions Z and above).

Errors Identified

"Netscape / IE/ Opera " - should present the minimal version needed.

13.3 Network system

"

Network software and protocols in order for systems to communicate:

- TCP/IP
- HTTP
- HTTPS
- FTP

"

Errors identified

Should be in requirement format.

13.3 Network system

Example of a possible correction

SWR7.   TCP/IP will be used for the systems to communicate.
SWR8.   HTTP will be used for the systems to communicate.
SWR9.   HTTPS will be used for the systems to communicate.
SWR10.   FTP will be used for the systems to communicate.

Errors identified

Should be in requirement format.

13.4 Mainframe system

"

- IBM Gateway
- DB2 database

"

Errors identified

Should be in requirement format.

13.4 Mainframe system

Example of a possible correction

SWR1.   IBM Gateway will be used as part of the mainframe system.
SWR2.   DB2 database will be used as part of the mainframe system.

Errors identified

Should be in requirement format.

13.5 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

"

Errors identified

"application development tools" - Which application development tools? Incomplete information.

"web server, application server and database software in development, test and production mode" - Lacking specification of the technologies.

13.5 Licenses

Example of a possible correction

SWR13. Valid licenses are required to run software from third party vendors.

SWR13.1. Valid licenses are required to run the development application X.

SWR13.2. Valid licenses are required to run the web server technology Y.

SWR13.3. Valid licenses are required to run the application server Z .

SWR13.4. Valid licenses are required to run the database software W for development.

SWR13.5. Valid licenses are required to run the database software W for testing.

SWR13.6. Valid licenses are required to run the database software W for development.

Errors identified

"application development tools" - Which application development tools? Incomplete information.

"web server, application server and database software in development, test and production mode" - Lacking specification of the technologies.
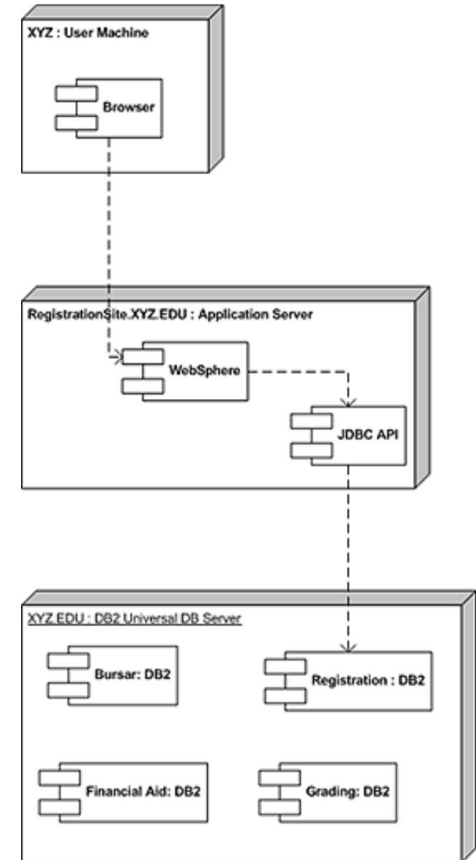
14. Deployment Requirements

Errors identified

No error was identified in this subsection.

Example of a possible correction

No correction needed.

Conclusion

To conclude, the corrections made to the original System Requirements Specifications document tried to address several prevalent issues and imprecisions that clouded the comprehension of the requirements.

One of the problems we noticed the most while correcting the document were imprecisions in language. From the use of ambiguous logical statements, overall vague descriptions, to terms implying totality, the document was plagued with small imprecisions that made specifications hard to pinpoint.

One other problem we noticed a lot was extreme coupling of requirements. Instead of having a single identifier for requirement, the original document had single titles associated with a paragraph for multiple requirements.

The last common problem we would like to address is the recurrent grammar and spelling issues. Be it a requirement specification document or not, every author of a document should strive to create a well written document, and should seek out other people to help with spotting mistakes.

By clarifying ambiguous language, adding important details, and ensuring the document is well written, this document can properly serve as a clear guideline for future development. We believe the corrections made could enhance the understanding among stakeholders and contribute to the overall success of the project.

Thank you for your attention

:)