Software Requirements Specification

for

Ambassador Tracking System, Release 1.0

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Contents

1. Introduction

1.1 Purpose

This particular piece of software is intended to increase the efficiency of business operations. These business operations include the maintenance of building inventory, tracking of Ambassador hours and status, and event planning for VIP students. At the moment these processes are performed by hand and occupy important time that could be used for more pressing matters. Also, when reports are needed from this information, the information must be manually gathered and added to spreadsheets to create visuals. During an academic year, more than 30 reports get generated, each of these reports is prone to human error, which can lead to potential missteps for the college as they use the data to make decisions that impact the entire college. In order to further the mission, the college must be well informed about its students and where they stand. With better tracking and integrity, the goals of recruiting new high achieving students will increase as the time that was spent on manually tracking data will spent on more critical processes such as planning events.

1.2 Scope

The scope of this project is to create the Ambassador Tracking System (ATS) that can help organize all the information the outreach office has to improve its efficiency. The product to be developed shall store the information of students in the VIP and ambassador programs. The program shall also store the inventory for the activities, during activities a lot of materials are needed but they are often scattered throughout the building in different storage areas. This makes it difficult to know what materials are available or which ones need to be purchased. The express goals of the software are to cut the time of performing less essential tasks. One of the main benefits is the accuracy of the data reports that are generated as the information is no longer transferred by hand which reduces the possibility of human error. With improved accuracy of data better decisions can be made about what events and activities students are best suited for students. Furthermore, new activities can be planned and tested for better engagement of students.

1.3 Product Overview

1.3.1 Product Perspective

The proposed system would need to interact with the Banner system that houses student data. The Banner system holds the student information such as UIN, this would pose a problem as the database system would need to be properly vetted for security as the information that would be exchanged is extremely sensitive. Another restriction related to security is the FREPA laws, these laws are intended to protect student information from being distributed to anyone other than the students themselves. In addition to the banner system, the product would need to be compatible with the Microsoft Windows operating system as the university utilizes Windows as its main OS. Although support for the Mac operating system would need to be developed eventually it is not of the highest priority. The system would also need to have a simple user interface as not all users would be familiar with it or with other systems that are similar, and to reduce the time needed to train users.

The proposed system is meant to replace the current manner in which information is maintained. At the moment all information is kept on paper or it must be requested from other departments outside of the college of engineering. Once the system is put in place user restrictions would arise. These restrictions come in the manner that only a few authorized would

be able to utilize the system as there is sensitive information stored on it. Another potential limitation would be that the users of the system would be unfamiliar with it and therefore would require training on its proper use and maintenance. However, the main constraint for this system would be the budget allocated to it. The outreach office does not have a budget allocated for the development of new systems, however, it does have one for student workers but that too is limited. Since the proposed system would take upwards of a year to be fully implemented and integrated and the lack of a budget would slow the development process significantly. The development process would need to be carried out by student workers who also have limited time and knowledge about how to build the system. This leads to another constraint, time itself. During the time of development, the system would not be in a usable state and therefore it would an asset that it is depreciating. As new technologies are released, new constraints are added, and new features are requested the system would be more likely to fall victim to the moving target problem.

1.3.2 Product Functions

The data tracking software shall perform a variety of different functions to help streamline the selecting, inserting, updating, and deleting data about the different programs put on by the college of engineering. The first main function of the software will be the addition of new students to the VIP and ambassador programs as well as the addition of new items to the inventory for outreach activities. The addition of new students shall be accomplished by the system when the user provides the required information such as the student's University Identification Number (UIN). The student information will then be stored in a table where the student can be found using any of the fields they contain. The addition of new materials will follow a similar pattern in which the user will need to provide specific information about a product before it can be added. Another function will be to store information about the activities and what materials are needed for those activities. This will facilitate the tracking of what materials are used and what needs to be replenished.

Furthermore, the system shall allow for the updating of information that is stored in the database. The editing of the information shall be done by taking input from the user to replace old data, some examples of the types of information that would be able to be modified are a student's major and the count of how many items are in storge. Certain information cannot be edited will such as a student's UIN or the id of a particular item. The system shall also support the searching and displaying of information based on certain criteria specified by the user, such as searching for a student by name.

Lastly, the system shall support the removal of information from the database. In the case of the inventory, the specified item and all its related data will be removed to the database, this action shall only be performed by the system administrator. In the case of the students, they will not be removed as there needs to be a record that the student participated in the program and the number of service hours that they performed. Therefore, the student will not be deleted, instead, a new table will be used to store previous students to maintain those records for future use.

1.3.3 User Characteristics

For this project, there will be several classes of stakeholders that need to be considered to have a representative sample of requirements and to avoid overlooking any set of stakeholders. Below are some of the stakeholder classes that are expected to influence the system and its development.

Users: This class of stakeholders is a diverse one that encompasses a large number of backgrounds. One of the main users of the software will the outreach specialist. This individual will be constantly checking and adding information to the different parts of the database, this person

is well educated and has worked in the school system for numerous years so they are familiar with the systems used by the university as well as systems used by the local school districts. Although this person has a lot of experience with other systems they do have a lack of technical expertise when it comes to said systems, support should be planned as technical issues arise often. Another type of user of the system is the student worker. The student workers have a wide range of experience and capabilities when it comes to the system. All of the student workers are engineering majors so they have a certain level of education and aptitude for solving problems but they may lack the technical expertise needed to solve any issues that may arise from a bug in the system. By representing the user class it becomes clear that making the system very user-friendly is necessary as not all users would be able to navigate a complex interface to achieve the tasks needed for the business process.
Customers: This class of stakeholders represents the U.A. Whitaker College of Engineering (WCE) at a high level. This class of stakeholders would be the class that funds the project, therefore, they would influence how the project is shaped. This class is comprised of highly educated individuals who often have doctorates in their fields. They are the ones who make decisions that affect the whole WCE and how business processes are conducted. It is important to maintain communication with this class of stakeholders as they can provide valuable information about how the system should interact with other systems in place and to what extent the system can change the way that the business process is conducted.
Software Engineers: For this project, the software engineers would either be a small team of software engineering majors or a single student. This class of stakeholders is unique as they are still students but they are in the process of learning and gaining the domain knowledge that would impact the project. Due to this fact requirements should be validated and verified often as it is likely that new domain knowledge gained through classes would change the scope of the project. As in the case of student workers, the developers of this system have a certain level of education and should have a similar aptitude for solving issues related to the development of the system. Since the developers would still be working on their skill as developers the project would need an extended timeline as it would not be feasible for it to be completed in a standard amount of time. This also makes documentation of critical importance as it is possible that the student that begins working on the project to leave and another student to pick up the project.

1.3.4 Limitations

1. Memory limitation – The system is limited in the memory of the machine provided by the university. There are standard machines that are provided by the university and the system needs to be able to carry out operations with those hardware specifications. For most staff the standard desktop pc provided has the following specs:
    a. Intel Core i7-9700
    b. 16GB 1x16GB 2400MHz DDR4
    c. 256 GB SSD
2. Security – for security reasons users must be authenticated, to do this they must use their university credentials
    a. The system must be able to interface with Banner to verify users
    b. Any changes within the system should not interfere with any outside system
3. The system must run on the Windows 10 operating system
4. The system must only be accessible on the University network
5. Maintenance to the system should be performed on Sundays so no interruptions to the normal business process occur

6. The system must accessible from multiple machines at the same time
7. The system must reflect changes made to the information within one minute
8. The system must indicate that a user is making changes to the information so that other users do not override any changes

2. References

1. Wiegers, Karl. *Cafeteria Ordering System Vision and Scope Document*, www.processimpact.com/projects/COS/COS Vision and Scope.docx
2. Fairley, Richard*. SWEBOK V3.0: Guide to the Software Engineering Body of Knowledge.* IEEE Computer Society.

3. Specific Requirments

3.1 Functions

Ambassador.Sort: Sort order by name	
.Display	The system shall allow the user to sort student information by name
.No:	If no sort other is selected the default one shall be alphabetical by student first name.
.Revert:	The system shall also allow the user to revert to the default sort order.
Ambassador. Add: Addition of Students	
.Add:	The system shall allow users to enter student information to add that student to the Ambassador program.
.Validate:	The user can input the student data into the provided text fields, those inputs will be shall validate the information to make sure that the correct format is used, for example, the UIN field shall only accept nine-digit positive whole numbers.
.WrongInfo:	The ATS will alert the user that the information that they input does not match the structure of the expected input
Ambassador.Secure: Access to the system	
.Pulse:	The system shall only be accessible from within the University secure network.
.NotAvailable:	The ATS will warn the user that they cannot access while connected to outside networks
Ambassador. Remove: Delete a student from ATS	
.BeGone:	The system shall allow the user to change the status of a student in the program. Instead of removing students from the program and losing the

	information, the students should be placed as inactive so their information maintained.
.AlreadyGone:	The system shall warn the user that the student is already marked as inactive
.Reset:	The ATS shall allow users to set the selected student back to active
Ambassador.Report: Generate reports	
.Generate:	The system shall allow for searching for specific information in order to create reports.
.Prompt:	The ATS shall prompt the user to select the information from the available selection to generate reports from.
.Display:	The ATS shall create the report and display it on the screen.

3.2 Performance requirements

Overall, the ATS shall shorten the time it takes to add students to the Ambassador program by 1 minute. The system needs to improve the time it takes to add and modify information about each student in the ambassador program, this will allow more time to be devoted to more essential business operations. 90% of the transactions shall be completed in less than 2 minutes. The ATS shall only support one terminal at a time, and therefore only one user at any given time. This is done to prevent table locking within the database and to reduce errors in the generated reports. The type of information that is expected is limited to alphanumeric strings, any use of special characters is not supported. The amount of data that is expected to be handled is the information for around 75 students per semester.

3.3 Usability requirements

The ATS shall have a simple user interface, this is done to accommodate the largest number of users as possible as not all are proficient in navigating complex interfaces. The ATS shall have a help section to facilitate user experience, this should be represented in the prototype demonstration followed by a survey to the client asking them to rate the interface complexity from 1-5. This will allow for a quantitative measure of user experience.

3.4 Interface requirements

1. Ambassador Addition Interface
    a. The purpose of this interface is to collect the needed information for each student in the program.
    b. This input will be provided by the user upon adding a student to the ATS
    c. The acceptable input for UIN is a nine-digit positive whole number, no other characters will be accepted. For the name and major only ASCII characters will be accepted.
    d. The interface shall load and display within 1 minute of launching
    e. This interface is related to the Banner interface as data needs to be validated
    f. The interface shall have 3 text fields with labels that indicate what information to input into each field.
    g. Upon successfully adding a student to the program a “success” message shall be displayed. Alternatively, if the process fails due to incorrect information ATS shall display an error message indicating where the error occurred.
2. Banner Interface
    a. The purpose of this interface is to validate that the student information provided is correct and they are enrolled in the University.

   b. The input will come from the user as they need to provide the valid information need to add the student to the program.
   c. The accuracy of this interface needs to be more than 95%.
   d. The interface shall validate all information in less 1 minute
   e. This interface is related to the Addition interface as it is the one that provides the information to be checked.
   f. The data formats shall match those of the Addition interface
   g. This interface will provide an error message if validation fails, otherwise, it shall allow the Addition interface to continue its processes.
3. Remove Interface
   a. The purpose of this interface is to remove students from the program by setting their status to inactive. This is done to maintain records of their participation in the program.
   b. The input will come from the user as they need to provide which student shall be removed. The output of this shall be all of the student information related to the student to be deleted
   c. The accuracy of this interface shall be based on the UIN of the student to be deleted matching exactly to the UIN of a student in the ATS.
   d. The student shall be removed from the active list of members within 2 minutes
   e. This interface is related to the searching interface as it must be used before selecting a student to remove
   f. Upon a successful removal, the ATS shall display a success message, if the operation fails due to the student has already been removed the ATS shall display a message detailing that.
4. Search Interface
   a. The purpose of this interface is to allow the users to search the students in the program for updates and removal.
   b. The input will be provided by the user in the form of UIN or name with the same validation Criteria as the Addition Interface.
   c. The acceptable input for UIN is a nine-digit positive whole number, no other characters will be accepted. For the name and major only ASCII characters will be accepted.
   d. The ATS shall display the results of the query in less than 1 minute.
   e. This Interface is related to the removing interface as a student must be found before they can be removed.

3.5 Logical Database Requirements

The ATS database shall handle input for UIN is a nine-digit positive whole number, no other characters will be accepted. For the name and major only ASCII characters will be accepted. All functions, such as search, will use the UIN or name information for each student. The ATS database is going to be used at a minimum of 2 times per week. The ATS database shall only be accessible from the designated terminals and only one of those terminals may access the ATS at any given time. To maintain integrity only the system administrator may truly delete an entry and no information can be changed other than a student's service-learning hours.

3.6 Design Constraints

The ATS is to be designed in accordance with FERPA regulation. This is needed as sensitive student information will be handled. The ATS is to be designed to run on the Windows 10 operating system so that it can be compatible with the standard university work stations referenced in section 1.3.4.

3.7 Software System Attributes

1. Reliability – For the system to be reliable correct input of student information is needed which why there several validation steps at the time of adding a new student to the ATS. Furthermore, the ability of standard users to manipulate the data is limited to adding hours to the service-learning section. This ensures that the ATS will produce the correct outputs.
2. Availability – For the system to be available there can only be one active user at any given time, attempts to access while there is another active user will be met with an error message indicating that there are other users in the system.
3. Security – To maintain the system secure from malicious access attempts a maximum of 5 consecutive unsuccessful log in attempts will be allowed. After this point, the ATS will lockdown and only the system administrator will be allowed to log in. A record of what user logs in and what they change shall also be maintained, only the system administrator shall have access to the logs.
4. Maintainability – For the ATS to be maintained properly each interface should contain its functions that perform one specific action within that interface. This will allow for the updating of the system to more efficient and reduce the introduction of regression faults.
5. Portability – The ATS must be used in the Windows 10 operating system as that is the most widely supported system by the University's Information Technology Services, it is also the system of most of the University work stations. The ATS should be developed with a language that supports object-oriented development (such as C++, Python, or Java) and that can run on other systems for future porting to other operating systems.

3.8 Supporting Information

3.8.1 Sample Inputs

UIN	Name	Major	Hours	isActive
123456789	Jeff Munoz	Environmental	32	True
987456321	Anita Sze	Bio	134	True
987654123	Cindy Lu	CM	5	True
456789123	Luis Hernandez	Software	98	False

4. Verification

4.1 Verification Methods

- Inspection – uses relevant documentation to confirm compliance with requirements
  - This will be used to verify the usability requirements
- Analysis – use of analytical data or simulations under defined conditions to show theoretical compliance
  - This will be used to verify the Banner interface requirement and the security requirements
- Demonstration - a qualitative exhibition of functional performance
  - This will be used to verify the functions, interface requirements and the Logical DataBase requirements

- Test - operability, supportability, or performance capability of an item is quantitatively verified when subjected to controlled conditions

5. Appendices

5.1 Assumptions and dependencies

One of the assumptions is that the Windows 10 operating system will be available. This is a valid assumption as the Windows 10 operating system is the most widely supported system by the University's Information Technology Services, it is also the system of most of the University work stations. However, if that OS is not available then the ATS would not be accessible and would need to be ported to either the MacOS or one of the Linux flavors. It is also assumed that new services can be added to Workday which will be replacing Banner in the near future. If this is not the case the system would not have and Interface that can check the validity of the data being input, only the format of that data would be check for correctness.

5.2 Acronyms and Abbreviations

- Ambassador – Student in the Engineering Ambassador program
- ATS – Ambassador Tracking System
- FGCU – Florida Gulf Coast University
- ITS – Information Technology Services
- OS – operating system
- University - Florida Gulf Coast University