Sepsis VR Tutorial Planning Document

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Table of Contents

1.0 Project Objectives

To create a virtual reality tutorial informing the user on treating a patient with sepsis. The tutorial contents are based upon the Adult Sepsis Pathway documents.

2.0 Project Schedule

The project timeline is eight weeks. Please see Appendix A for a further breakdown of each week.

3.0 Project Human Resource Requirements

This project requires a Senior Software Developer, Junior Software Developer, UI/UX Designer and a 3D Artist.

3.1 Roles and Responsibilities

3.1.1 Senior Software Developer

The senior software developer is responsible for the following:

- Preparing project documentation and distributing to all team members
- Holds meetings to review milestones to ensure project timeline is kept.
- Developing and testing the application and providing any documentation that results from either of those actions.
- Mentoring the junior developer
- Collaborating with other team members to ensure application's success.
- Other responsibilities as defined by the QA plan.

3.1.2 Junior Software Developer

The junior software developer is responsible for the following:

- Developing and testing the application and providing any documentation that results from either of those actions.
- Other responsibilities as defined by the QA plan.

3.1.3 UI/UX Designer

The UI/UX Designer is responsible for the following:

- Working with the software team to ensure the user interface and user experience are excellent.
- Approving or providing mockups for the software team and 3D artist
- Executing the usability testing.
- Other responsibilities as defined by the QA plan.

3.1.4 3D Artist

The 3D Artist is responsible for the following:

- Creating 3D models and 3D animations based on input provided by the UI/UX designer and senior software developer.

4.0 Project Milestones

The following project milestones have been created and include ones that will be replicated in the Quality Assurance Plan.

- Project Start
- Project Documentation Approval
- Quality Assurance Plan Approval
- Development Start
- Data Testing Development for 3D iteration Completed
- Data Testing Passed for 3D iteration
- Animations Completed
- UI Testing Completed
- UI Testing Passed
- 3D iteration of tutorial
- First Usability Testing Completed
- Data Testing Development for VR iteration Completed
- Data Testing Passed for VR iteration
- UI Testing Completed
- UI Testing Passed
- VR iteration of tutorial
- Performance Testing Completed
- Second Usability Testing Completed
- Findings from Usability Testing Integrated into Application
- Development Complete
- Documentation of Quality Assurance Completed
- Project Completion

5.0 Quality Assurance Plan

5.1 Objectives

5.1.1 Purpose

This section of the Sepsis VR Tutorial application describes the plan for testing. The test plan supports the following objectives:

- Identify existing project information and the software that should be tested.
- List the recommended test requirements
- List some examples of test cases for each test type.
- Describe each test type.
- Identify required resources
- List deliverable elements of test activities
- List any risks or assumptions and dependencies
- Describe the test schedule and test milestones

5.1.2 Scope

This section of the document details the testing that will be performed for the Sepsis VR tutorial project. It defines the overall testing requirements and documents:

- What will be tested
- How testing will be performed

5.2 Test Requirements

Testing will occur in different stages of development for the Sepsis VR tutorial project. The sub-sections below describe what will be tested.

5.2.1 Data Testing

- Verify access to XML file
- Verify correct retrieval of XML contents
- Verify correct retrieval of audio
- Verify correct retrieval of next scene in tutorial

5.2.2 User Interface Testing

- Verify continue action works as expected (3D, VR)
- Verify back action works as expected (3D, VR)
- Verify audio action works as expected (3D, VR)
- Verify audio feedback works as expected (3D, VR)
- Verify pause action works as expected (3D, VR)
- Verify start action works as expected (3D, VR)
- Verify any other interactable items work as expected (3D, VR)
- Verify transitions between various scenes work as expected
    - Start to scene 1
    - Scene X to Scene Y
    - Scene X to Pause
    - Pause to Scene X
    - Scene X to End
    - End to Start
- Verify 3D images and animations work as expected (3D, VR)
- Verify text on screen is readable (3D, VR)
- Verify no simulation sickness (VR)

5.2.3 Performance Testing

- Verify response time between scenes
    - Start to scene 1
    - Scene X to Scene Y
    - Scene X to Pause
    - Pause to Scene X
    - Scene X to End
    - End to Start
- Verify response time between audio action and audio start
- Verify response time for XML string retrieval

5.2.4 Usability Testing

This will be done with the end client to ensure the information being conveyed to the user is correct and to the satisfaction of the client. The testing will occur at various milestones to ensure client satisfaction and be able to react to any potential changes.

5.3 Test Strategy

The test strategy presents the recommended approach to the testing of the software application. The previous section described what will be tested; this describes how it will be tested.

5.3.1 Test Type

5.3.1.1 Data Testing

The data testing should focus on ensuring that the item that was set to be retrieved is the item that was retrieved.

Test Objective	Ensure proper data retrieval
Technique	Unit testing
Completion Criteria	All planned tests have been developed. All identified defects have been addressed.

Example of Data Testing Test Case

Test ID	Unique Identifier
Test Description	This test will determine if the correct string is obtained from the XML file.
Pre-requisites	XML parsing development must be completed and XML file must be populated
Test Steps	1. Create Unit Test method 2. Call XML parser function with a specific string 3. Compare the string returned with the known value that it should be 4. Return the comparison result
Test Data	XML file, string input, known string value
Expected Result	The string input and known string value should equal.
Actual Result	
Created By	Name of Person Who Created
Date of Creation	YYYY-MM-DD

Executed By	Name of Person Who Executed
Date of Execution	YYYY-MM-DD

5.3.1.2 User Interface Testing

User Interface testing verifies a user's interaction with the software. The goal of user interface testing is to ensure that the interface has provided the user with the proper navigation through the application.

Test Objective	Verify the following: - Navigation through the app properly reflects requirements - Objects (menu items, buttons, etc) conform to standards
Technique	Create/modify tests for each scene to verify proper navigation and object states for each application scene and object.
Completion Criteria	Each scene successfully verified and remains consistent within an acceptable deviation.

Example of User Interface Testing Test Case

Test ID	Unique Identifier
Test Description	Ensures that the navigation from Airways scene sends the user to Breathing scene
Pre-requisites	Transitions between these steps are complete. The continue action should be implemented and working. Interface should indicate which step is currently in the main view.
Test Steps	1. Load into the application 2. Navigate to the Airways scene 3. Wait for the scene to fully load if necessary 4. Use the continue action to initiate the next scene 5. Wait for the next scene to load and confirm it is the Breathing scene
Test Data	
Expected Result	Initiating the Continue action on the Airways scene should result in the breathing scene

Actual Result	
Created By	Name of Person Who Created
Date of Creation	YYYY-MM-DD
Executed By	Name of Person Who Executed
Date of Execution	YYYY-MM-DD

5.3.1.3 Performance Testing

Performance testing measures response times and other time sensitive requirements. The goal of performance testing is done to ensure that time requirements have been reached. Performance testing will be employed at different times through the development process.

Test Objective	Validate response time for identified functions
Techniques	Use test scripts for the modification of the data files used in data retrieval. Use unit tests for response times between scenes. Use scripts to mimic user input to test response times of user inputs.
Completion Criteria	Successful completion of scripts without any failures and within acceptable standard of time.
Special Considerations	Tests should be executed on a dedicated machine to ensure accuracy.

Example of Performance Testing Test Case

Test ID	Unique Identifier
Test Description	Test to determine the response times from when the audio action is initiated to the audio playing
Pre-requisites	Audio playback functionality must be implemented Audio interaction must be implemented Talk to speech(TTS) must be implemented or audio files must generated
Test Steps	1. Locate the functionality for audio 2. Surround the functionality with timers 3. Output the timer information with

	contextual information to a log file. 4. Compare the log file information to the time identified to ensure within standard.
Test Data	Audio file if TTS not implemented Standard response time defined by team.
Expected Result	The response time should be within the standard.
Actual Result	
Created By	Name of Person Who Created
Date of Creation	YYYY-MM-DD
Executed By	Name of Person Who Executed
Date of Execution	YYYY-MM-DD

5.3.1.4 Usability Testing

Usability testing verifies a user's overall experience within the application. The goal of usability testing is to identify any usability problems and to determine the client's satisfaction with the application.

Test Objective	To validate the usability of the application. To identify usability issues, if any.
Technique	A moderated test run by the UI/UX designer.
Completion Criteria	Satisfaction from the client. All identified problems are addressed and/or explained with industry reasoning to client's satisfaction.

Example of Usability Testing Test Case

Test ID	Unique Identifier
Test Description	User will run through the application start to finish
Pre-requisites	The 3D or VR application must be completed
Test Steps	This is open to interpretation and the UI/UX designer should not give much input to avoid spoiling natural discovery by the user.
Test Data	
Expected Result	No expected result here other than ideally the user being able

	to use the application without issue or concerns.
Actual Result	
Created By	Name of Person Who Created
Date of Creation	YYYY-MM-DD
Executed By	Name of Person Who Executed
Date of Execution	YYYY-MM-DD

5.4 Resources

This section presents the recommended resources for testing the Sepsis VR tutorial project, their main responsibilities, and their time requirements.

5.4.1 Roles

5.4.1.1 Senior Software Developer

The senior software developer is responsible for the following:

- Assist in manual UI testing
- Ensure milestones are on track
- Complete unit tests for tasks developed
- Log any defects found during testing
- Generate test plan
- Generate test suite
- Generate test scripts
- Create documentation required by results of all tests
- Obtaining and setting up the test environment

5.4.1.2 Junior Software Developer

The junior software developer is responsible for the following:

- Assist in manual UI testing
- Complete unit tests for tasks developed
- Log any defects found during testing
- Aid senior developer in creation of test suite

5.4.1.3 UI/UX Designer

The UI/UX Designer is responsible for the following:

- Prepare standards for the user interface testing
- Execute usability testing
- Prepare results from usability testing

5.4.2 Tools

The following tools are required:

- Unity per developer
- Oculus Rift(s)
- Laptop Computer to compliment Oculus Rift

5.5 Milestones

The following milestones pertain to the Quality Assurance Plan:

- Quality Assurance Plan Approval
- Data Testing Development for 3D iteration Completed
- Data Testing Passed for 3D iteration
- UI Testing Completed
- UI Testing Passed
- 3D iteration of tutorial
- First Usability Testing Completed
- Data Testing Development for VR iteration Completed
- Data Testing Passed for VR iteration
- UI Testing Completed
- UI Testing Passed
- VR iteration of tutorial
- Performance Testing Completed
- Second Usability Testing Completed
- Overall Usability Testing Passed
- Findings from Usability Testing Integrated into Application
- Documentation of Quality Assurance Completed

5.6 Deliverables

The following deliverables will be provided during the entirety of the quality assurance plan

- QA Plan
- Test Environment
- Test Suite
- Test Data Sets
- Test Scripts
- Test Defect Reports
- QA Results

5.6.1 Test Suite

The testing suite will define all test cases and scripts required.

5.6.2 Test Logs

A board style software like JIRA, Trello, or Azure DevOps will be utilized to track each test case.

5.6.3 Defect Reports

Any defects discovered will be reported to the chosen board style software. The following principles should be kept in mind when it comes to defect reporting:

- Document the defect scenario and any potential solutions
- Reproduce before reporting
- Ensure you have clear step by step instructions

- Specify the context and avoid conveying information that can be interpreted differently
- One defect per report
- Detail what you see and what you expect to see
- Provide screenshots if possible

5.7 Test Schedule

The test schedule will be integrated into the overall project schedule. Please see Appendix A.

5.8 Dependencies

Each test is dependent on the developer for the case to be tested. The schedule will need to be watched to ensure both development and testing remains on track.

5.9 Risk/Assumptions

This assumes that all parties involved are able to complete everything on time. This also assumes all parties are available to work with the schedule. There is a risk for bugs because of the unknown skills of the team members.

Appendix A – Weekly Schedule

Week 1

In the first week the following items are a general idea of what will occur:

- Team meeting to discuss the overall project plan including QA plan and finalize details.
- Daily meetings to discuss progress, road blocks, etc.
- The UI/UX designer works with the senior software developer on the initial mockup designs as shown in Appendix B.
- The UI/UX designer will complete the menu designs (start and pause)
- The 3D artist is given general ideas for 3D images and animations and will work on three of them this week.
- The XML development will occur including data test, XML file creation, and XML parsing.
- The creation of various objects and actions within Unity will occur. This includes any logic to allow the objects to be utilized by other aspects within the application
- The scene transition development should begin as well.
- Milestones achieved in week 1:
    - Project Start
    - Project Documentation Approval
        - Quality Assurance Plan Approval
    - Development Start

Week 2

In the second week the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc.
- The Testing Suite will be completed. See 5.6.1 for more details on what it contains.
- The start menu and pause menu development will be completed.
- Scene transition data testing should be completed and results brought to the team.
- More 3D models and animations will be completed and started.
- Text to speech will be investigated and discussed with the team to decide on if it is feasible or audio files will need to be created.
- Working with 1 of the 3D models from week one to ensure it is able to be interacted with in the application.
- Milestones achieved in week 2:
    - Data Testing Development for 3D iteration should be completed.

Week 3

In the third week, the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc.
- Integrating any changes from the data testing results and re-running.
- Development on the audio file functionality will be completed depending on which was chosen in week two.
- The audio button object and logic will be completed and basic audio testing completed.
- Working with 1 of the 3D models from week one to ensure it is able to be interacted with in the application.
- Other models should be integrated into the application where necessary.
- The animation from week two should be completed and the tablet 3D model should be completed and another animation started.
- Milestones completed in week three:
    - Data testing should be passed.

Week 4

In the fourth week, the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc
- The final animation completed by the 3D artist will be integrated into the application where necessary.
- The UI testing should begin as outlined in 5.2.2
- Any defects found should be documented and be integrated into the system
- After the team is generally happy with the outcome of UI testing, usability testing will occur with the client
- The UI/UX designer will meet with the team to discuss the outcome of the usability testing and if there are any changes, the development of these will begin
- Milestones completed in week four:
    - Animations completed
    - UI testing should be completed and passing
    - The 3D iteration of the tutorial should be completed pending any final changes from usability
    - The first usability test should be completed.

Week 5

In the fifth week, the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc.
- The development of any changes from usability test should be completed.
- The VR development should begin
    - Setting up the user and the interactions with VR in mind
- The 3D tablet model should be integrated into the application and be able to interact with it.
- No milestones completed in this week.

Week 6

In the sixth week, the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc.
- The 3D tablet development should continue and the tablet should be integrated into the tutorial scenes
- The tutorial scenes should be updated for VR if necessary.
- Performance testing development should begin.
- UI and Data testing should begin for the VR version of the application.
- Milestones completed in this week
    - Data testing development for VR should be completed

Week 7

In the seventh week, the following items are a general idea of what will occur:

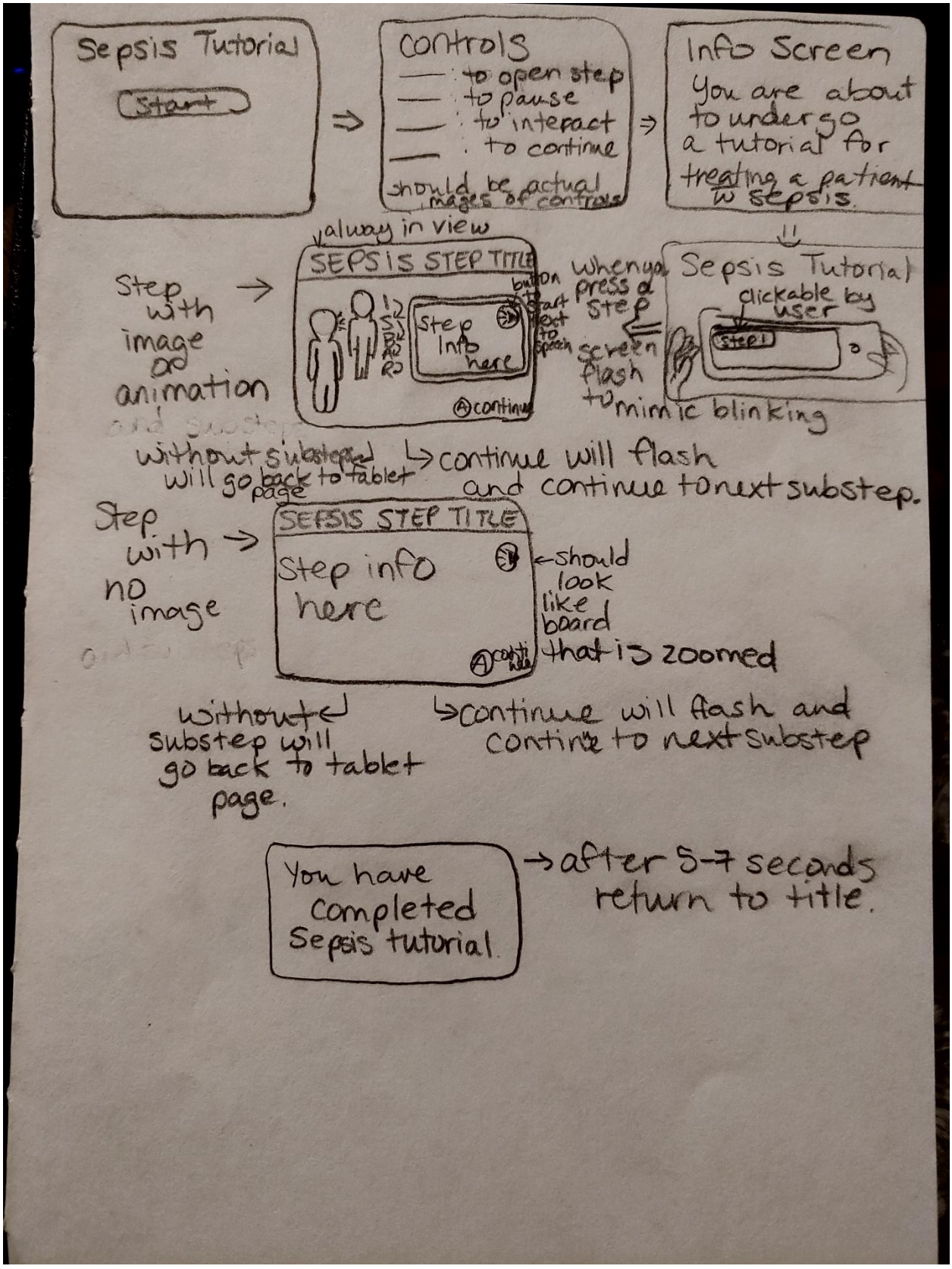
- Daily meetings to discuss progress, road blocks, etc.
- Continuation of UI testing from previous week and should be completed.
- Performance testing development should be completed and the testing begin.
- Results from the UI, Data, performance testing should be discussed and any changes to be made should be integrated.
- UI testing occurring again after changes made
- Milestones completed in this week
    - Data testing should be passed for VR iteration
    - UI testing completed
    - UI testing passed
    - VR iteration of the tutorial completed
    - Performance testing completed

Week 8

In the eighth week, the following items are a general idea of what will occur:

- Daily meetings to discuss progress, road blocks, etc.
- Final project documentation should be completed
- The VR usability test should be conducted and findings given to the team
- Pending any changes from the client, those should be integrated into the application
- Milestones completed in this week:
    - Second usability test completed
    - Findings from usability test integrated into application
    - Development is completed on project.
    - Documentation for the project is completed
    - Project is completed.

Appendix B – Initial Mockup Designs



Appendix C – Work to be completed by Tybie

The following work should be completed by Tybie between Tuesday February 18th, 2020 and Friday February 21st, 2020 at 3:00 PM. This assumes 16 hours between these dates to complete the following:

- Create the XML parsing logic
- Create the XML file with prepared strings
- Create unit tests to ensure strings are being retrieved properly
- Create objects within Unity
    - Continue Action Area
    - Title Text Area for Scene Titles
    - Text Area for Scene Text
- Create skeleton scenes and/or sub-scenes for A (Airways), B (Breathing), and C (Circulation)
    - These will likely contain simply a continue action, the title area and the text area for viewing on the screen.
- Create executable of the first 3 sub-steps of the Resuscitate step.
- Create readme document of how to use executable