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Requirements

Introduction

The Requirements page contains all the material for the requirements analysis phase, from the background of the project to personas, from motivational models(do-be-feel lists) to user stories. There are four subsections:

Background

This page introduces the background information of the project and displays the project goal, problem, challenge, and scope.

Motivational modelling

This page presents the motivational model of the project, which includes the do-be-feel list and goal model.

Personas

This page designs the personas for the project based on the possible users of the game.

User Stories & Acceptance Criteria

This page shows all possible user stories based on user requirements analysis techniques above and designs the corresponding acceptance crite.

To learn more information about the subsections, please follow the links below:

- [Background](#)
- [Motivational modelling](#)
- [Personas](#)
- [User Stories & Acceptance Criteria](#)

Background

Case Introduction

The Boeing 737 is a pure jet airliner with engines that increase fuel efficiency and operational efficiency. After the 737 entered service, international airlines were eager to place orders for the new aircraft. However, there were significant flaws in the 737's rudder design, which were responsible for several air accidents. So Boeing introduced the 737Max with the MCAS system. However, the newly added system is not mentioned in the flight manual and training program of the 737Max series, and the operation of the 737Max is the same as that of the 737NG series. This has left many pilots unaware of the system's existence. After the replacement of the new 737Max flight manual and the improvement of the original MCAS system, the 737Max still caused many air accidents, and the reasons are very complicated.

Project Aim

This project aims to develop an online interactive game to study the causes of accidents caused by Boeing 737Max models. The game has five roles for players to choose from Boeing executive, software developer, airplane pilot, aeronautical engineer, and Federal Aviation Administration (FAA) worker. Through the interaction between the five characters, the game explores how people will make decisions following the responsibility and ethics of their roles in different environments. And these decisions will also affect other characteristics to make different decisions in different situations. The choices of the five characters will cause the final result.

Potential Problems

There are many problems with this project. One is that the cause of the air crash caused by 737 is unknown, and the five roles will make decisions based on their interests. Under the influence of various interests, the causes of air crash are numerous, and therefore The resulting game results may also be diverse. The second is to determine the relevant Stakeholders in this project, how to assess their interests, how the developers should treat them, and what kind of responsibilities should developers have for them.

Goal

The goal of the project is to develop an online interactive game used by students. Students make different decisions in different plots according to various game characters to achieve their goals in the game. Through this game mode, students can experience how ethics can affect their personal choice. The results of this project will be used in teaching tools but also to enable students to experience the ethics, government, and unintended consequences that exist in the construction system. And inspire students to practice reflection.

Scope of the Project

The scope of the project is to develop a multiplayer interactive online game based on the client's requirements, which can be played by students and teachers. Players can assign one of 5 different characters and make corresponding decisions according to different plots, and each decision can affect the final result. The player can play the game according to the guidance(tutorials) and can be effect by the choice of other characters. The final result will be presented to the player, from which the player can observe the consequences of their decision in different scenarios or plots.

Challenge

The challenge of this project is that this is a multiplayer online interactive game, so the performance requirements of the system are essential, including synchronization and real-time. In addition, the player's decision needs to use the decision tree to make predictions and choices. The construction of the decision-tree is one of the cores of this project, and it reflects the mapping relationship of different characters' moral choices in the game.

Briefing document from client:



Motivational modelling

Step 1: Create do, be, feel, who lists

Step 2: Create Goal Model

Step 1: Create do, be, feel, who lists

- Do: What should the software do?
- Be: How should it be done?
- Feel: Emotional (or social) considerations
- Who: Users involved, Stakeholder

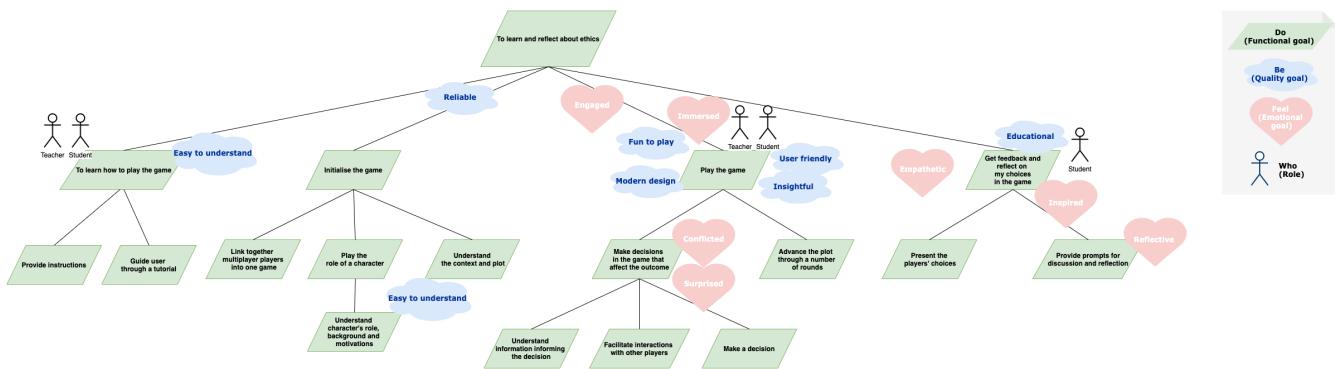
Do (Functional goal)	Be (Quality goal)	Feel (Emotional goal)	Who (Role)
<ol style="list-style-type: none">1. To learn and reflect about ethics<ol style="list-style-type: none">a. To learn how to play the game<ul style="list-style-type: none">• Provide instructions• Guide user through a tutorialb. Initialise the game<ul style="list-style-type: none">• Link together multiplayer players into one game• Play the role of a character<ul style="list-style-type: none">• Understand character's role, background and motivations• Understand the context and plotc. Play the game<ul style="list-style-type: none">• Make decisions in the game that affect the outcome<ul style="list-style-type: none">• Understand information informing the decision• Facilitate interactions with other players• Make a decision• Advance the plot through a number of roundsd. Get feedback and reflect on my choices in the game<ul style="list-style-type: none">• Present the players' choices• Provide prompts for discussion and reflection	<ol style="list-style-type: none">1. Modern design2. User friendly3. Reliable4. Insightful5. Fun to play6. Easy to understand7. Educational8. Unpredictable	<ol style="list-style-type: none">1. Engaged2. Surprised3. Empathetic4. Immersed5. Conflicted6. Reflective7. Inspired	<ol style="list-style-type: none">1. Student2. Teacher

Step 2: Create Goal Model

We use draw.io to create the goal model.

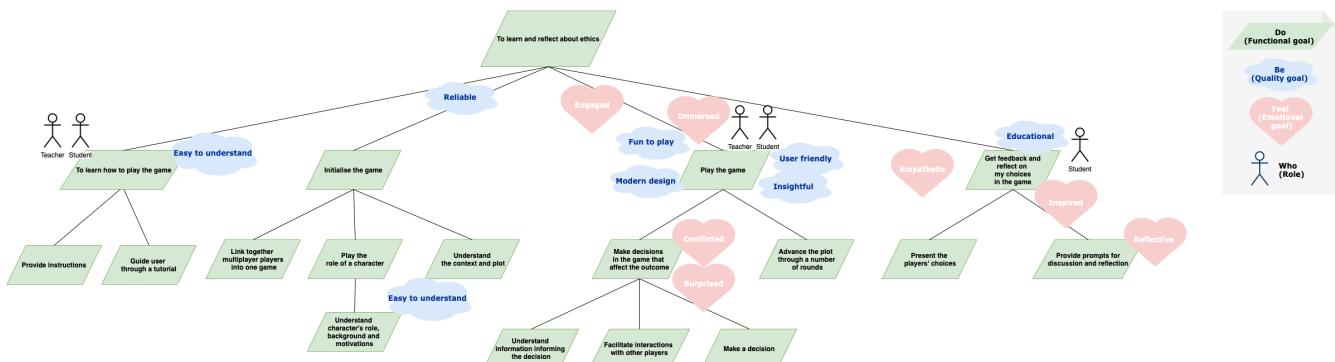
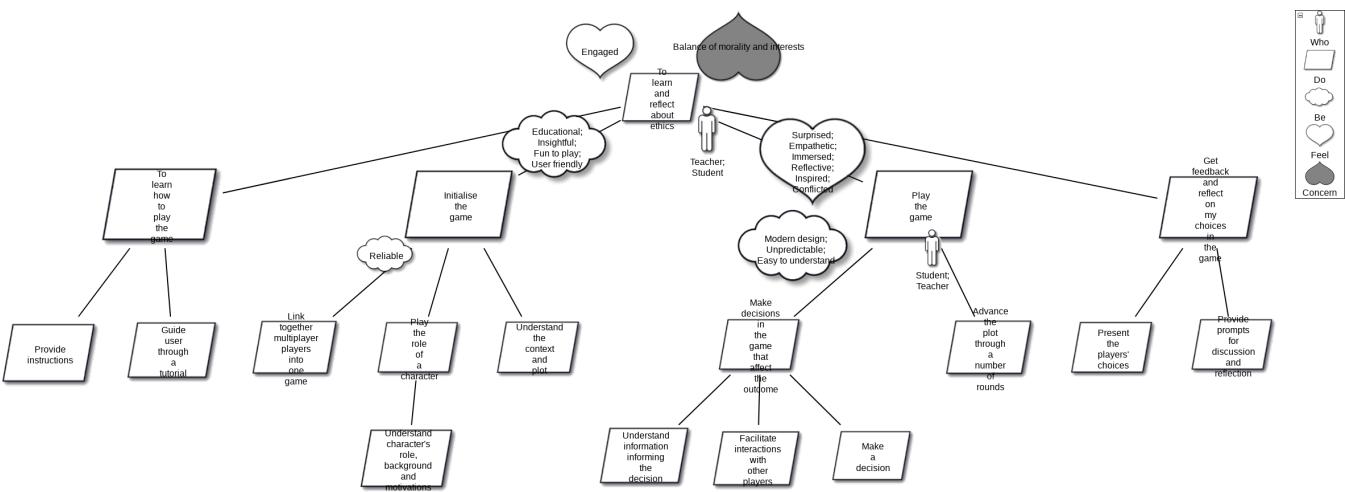
<https://drive.google.com/file/d/1KfO3etlUKYpDR2fAM3Gp8YnCOsWr7wHA/view?usp=sharing>

version 1.0



version 2.0

Edit Link: https://momo-swen90009.eresearch.unimelb.edu.au/goal_model/edit?MID=d7908fe5-725f-11ea-8249-0242ac120003



Personas

There are three personas for this project.

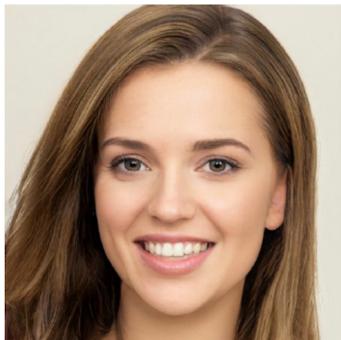
1. Student

- study ethics
- study engineering

2. Teacher

- ethics professor

Emily Perry



"Integrity has no need of rules."

Age: 15-30
Student: Philosophy Student
Location: Melbourne, VIC, Australia

Goals

- Learn ethics and apply it in different scenarios.
- Learn and self-reflect by playing the game.
- Observe other students' behaviours.

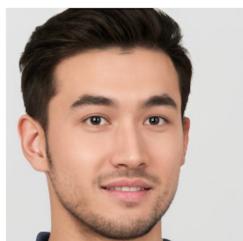
Frustration

- Not able to apply ethics principals to real-life cases.
- Lack of opportunities to observe people's reactions in related to moral good.

Bio

Emily is an undergraduate student at the University of Melbourne. She is majored in philosophy. Ethics majors study the concept of moral good and practice applying it in different situations. Some ethical topics are obscure and hard to feel. She wants to learn and apply what she has been learned at ethics classes in real life.

Steve Wilson



"A quotation that captures this user's personality."

Age: 15-30
Work: Engineering Student
Location: Melbourne, VIC, Australia

Goals

- Pass the ethics subject with a score that is not too bad.
- Learn some moral principals.

Frustrations

- Not sure how this is related to his major.
- Learning a philosophy subject is very hard for him.

Bio

Steve is an undergraduate student at the University of Melbourne. He is majored in computer science. He spends most of his time learning programming languages and algorithms. He also has to do lots of projects for learning purpose. In particular, he is interested in software security systems. He wish to find a job in the industry after he graduated.

Peter Miller



Goals

- Teaching students ethics and want students to be engaged.
- hoping students can learn and reflect on real life cases by playing the game.

Frustrations

- Some students feel hard to understand ethical topics.
- Some students don't see how ethical topics are related to their real life.

"Formal education teaches how to stand, but to see the rainbow you must come out and walk many steps on your own."

Age: 45-70
Work: Professor
Location: Melbourne, VIC,
Australia

Bio

Peter is a professor teaching in philosophy at the University of Melbourne. The study of philosophy helps people to enhance their ability to solve problems, persuasive powers, and writing skills. But how to actually let the students feel the ethical topics? How is ethical topics related to students' future life? He wishes to use this game as a tool to let his students reflect on real life cases.

User Stories & Acceptance Criteria

Functional Goals

note: US_11 and US_13 are removed because of unneccesity

User story ID	As a...	I want...	so...	Priority	Sprint	Achieved
US_01	Student	To have an option to view help for the game.	I can get familiar with the features of the game, such as what actions I will take, how the UI works and how gameplay will work.	Must have	2	✓
US_02	Student /Teacher	To be able to join a particular game session of my choosing.	I can join a game with any other users in it.	Must have	1	✓
US_03	Student /Teacher	To be able to initialise a game session.	I can create a session for other users to join and play.	Must have	1	✓
US_04	Student	To have an option to choose which character I play in the game.	I can more easily play unique characters, or characters I'd prefer over others.	Must have	2	✓
US_05	Student	To have access to a detailed backstory for a character, as well as their character in the company before the game start.	I can empathise with and adopt the perspective of this character more easily.	Must have	2	✓
US_06	Student	To be introduced to some game background information before game start.	I can understand the general game.	Must have	1	✓
US_07	Student	To receive a set of goals outlining what objectives my character needs to achieve by game end.	I have some guiding direction in terms of how I approach key decisions in-game.	Must have	3	✓
US_08	Student	To receive prompts where necessary to facilitate discussion or personal decision-making.	I am clearly aware at all times of exactly what is required of me at that time during the game.	Must have	3	✓
US_09	Student	To be presented with an intuitive and clear UI for any decision-making.	I can clearly understand all of the options that are available, as well as the current game situation.	Must have	2, 3	✓
US_10	Student	To be able to frequently discuss decisions with other characters in the game.	I can communicate decisions with classmates, and negotiate for better outcomes related to my goals.	Must have	3	✓
US_12	Student	To be able to see all chosen decisions made for all of my personal and group decisions.	I can get some insight into what other group members decided, and recall any forgotten decisions made earlier in the game.	Should have	3	✓
US_14(lack in digital prototype recommend to add confirmation message window when the user made decisions and this message will be popped up[have two-button "cancel" and "continue"])	Student	To be prompted for confirmation whenever I make a decision.	I can be sure that I did not make the wrong decision.	Should have	4	n/a - no longer taken to be a requirement; we avoid mistaken actions with a radio button interface instead
US_15	Teacher	For the decision-making process to be relatively complex, in that there should be no clear-cut 'correct' decision.	I can feel confident that students who play won't follow the same line of decision-making, and will enjoy unique experiences depending upon their own decision-making habits.	Should have	3, 4	✓
US_16(lack in digital prototype recommend add some power info in "your information" page in our digital prototype)	Teacher	For the game to present asymmetric information and distribute asymmetric power, based upon the characters for each player.	The game more closely mimics the reality of a working industry environment, which should improve student engagement and outcomes.	Should have	3, 4	✓

US_17	Student	To receive concrete outcomes at the conclusion of the game related to my goals, as well as the plot, all based on decisions made throughout the game.	I can clearly see whether or not I achieved my character goals or not, and also reflect upon whether personal success, if attained, came at any cost to plot outcomes.	Must have	4	<input checked="" type="checkbox"/>
US_18	Student	To receive some feedback in the form of hints after the game is completed and results presented.	I can get some takeaways about different ways to approach my decision-making for future playthroughs.	Could Have	4	<input checked="" type="checkbox"/>
US_19	Teacher	To limit the discussion time for each decision in game	I can make students put more focus on the contradictive information and force them to make decisions, which will improve their critical thinking of whether their decisions are right to do.	Could have	3	n/a - timer functionality no longer taken to be a requirement due to the complexity of implementation

Non-Functional Goals

User story ID	As a...	I want...	So...	Priority	Sprint	Achieved
US_20	Student	The UI to be user friendly.	I can clearly and effectively navigate the game, making for a quicker and more decision-oriented game.	Should have	2	<input checked="" type="checkbox"/>
US_21	Student	The game to be highly reliable.	I don't need to worry about losing my game session during a game.	Must have	2	<input checked="" type="checkbox"/>
US_22	Student	The rules of the game to be easy and understandable.	I can intuitively understand how the game works quickly.	Should have	4	<input checked="" type="checkbox"/>
US_23	Student Teacher	The game to have some educational meaning.	I can learn what ethical issues I have to face in an industry setting and learn how to make better decisions as a result.	Must have	4	<input checked="" type="checkbox"/>
US_24	Student	The game is fun and motivational.	I can remain interested in the game and its development throughout and to play to the end.	Should have	4	<input checked="" type="checkbox"/>
US_25	Student	The game to be insightful.	The learning outcomes of the game will stick with me when I enter the industry.	Should have	4	<input checked="" type="checkbox"/>

Acceptance Criteria

Note: the acceptance criteria below reflect our understanding as at the inception/requirements analysis phase. Any subsequent updates to these criteria during development will be reflected at [Acceptance Testing](#), along with the acceptance testing results.

User Story ID	Acceptance Criteria ID	Given	When	Then
US_01	AC_01	The student confirms that he/she has already connected to the game and can see the main page of the game.	He/She clicks "Help" button on the main page.	He/She can enter the help/tutorial part which can help he/she to familiar with the game
US_02	AC_02	The student/teacher confirms that he/she has already joined the game by inputting their name and <u>game ID(if they choose to join the game)</u> .	He/She clicks the next arrow button in "start a new game" or "join a game" page	He/She would enter the "waiting" page and wait for other online users to join with he/she and play together.
US_03	AC_03	The student/teacher has started the application and can see the main page of the game.	He/She clicks the "New Game" button.	He/She is assigned an "ID" for other players to join.
US_04	AC_04	The student confirms that he/she has already started the game and see the game background and roles introduction.	He/She enters "choose your role" page.	He/She could choose the wanted character if it is his/her turn.
US_05	AC_05	The student has already seen the "background" page	He/She clicks "next button" to see the role introduction page.	He/She could see a brief introduction to each role in the game.
US_06	AC_06	The student has already started the game when other users are ready for the game	He/She clicks "next button" to see the "background" page.	He/She will see an informative context to introduce the background of the game.
US_07	AC_07	The student has finished choosing his/her preferred role and other user finished choosing their role already	He/She clicks "start game" button on "choose your role" page.	He/She will see a clear set of goals for his/her own chosen character, with quantitative objectives in order to achieve each.

US_08	AC_08	The student has started the game/or(and) ready to enter to the beginning of each chapter	He/She clicks "next" button and enter the "chapter" page and clicks "next" arrow enter the "your information" page	He/She will sequence to see related prompts which help to facilitate discussion or personal decision-making.
US_09	AC_09	For each round, the student knows the story plot and make sure he/she knows their personal player prompts.	He/She clicks "next" arrow and enter "group discussion" page	He/She enter the discussion page and see the question and optional decisions in a user-friendly UI.
US_10	AC_10	The student has started a game as any character and finish the prompts at the beginning of each round	He/She has enter "Group Discussion" page and click the "Ready to discuss" button to start talking online	He/She finish his/her statement and interaction with other users in 5 minutes
US_12	AC_12	Student ends the game and also finish the conclusion and outcome.	He/She clicks "reflection" button on "outcome" page	He/She will see a list of all decisions made throughout the game concerning that character.
US_14	AC_14	The student has already finished talking with other users and ready to answer the question in each round	He/She selects an option of a question	He/She is presented with a confirmation dialogue before their decision is submitted.
US_15	AC_15	The student is in a decision-making phase of the game.	He/She makes a decision.	He/She possesses some level of uncertainty as to some consequences of that decision in the game context.
US_16	AC_16_01	Students have been assigned characters and are at the start of a new round.	Students click "next" on the first context page.	Each student is presented with additional information which is representative of how relevant the decision being made is to the character.
US_16	AC_16_02	Students have been assigned characters and have made a decision for around.	All students have voted for that round.	The final group decision made for the round is weighted based on each student's character.
US_17	AC_17	The student has already ended the game and read the conclusion on the next page.	He/She clicks next arrow on the "conclusion" page	He/She is presented with the game-outcomes with additional details relevant to the student's character.
US_18	AC_18	The student has reached the game-ending page and get the conclusion and outcome.	He/She clicks "reflection" button on "outcome" page.	He/She is presented with a reflection page with feedback.
US_19	AC_19	For each round, the student knows the story plot, make sure he/she knows their personal player prompts and is ready to be engaged in the discussion.	He/She clicks the "voice" button at the end of the personal character prompts page.	The timer can start counting down until the end of the specified time

Acceptance Tests

Note: the acceptance tests below reflect our understanding as at the inception/requirements analysis phase. Any subsequent updates to these tests during development will be reflected at [Acceptance Testing](#), along with the acceptance testing results.

*For all tests we assume that we have already opened the application and is on the initial start page.

User Story ID	Acceptance Criteria ID	Acceptance Test ID	Test*	Expected Result
US_01	AC_01	AT_01_01	1. User Clicks "Help" button on the main page	Help(Tutorial) Page content is displayed.
US_02	AC_02	AT_02_01	Requires 2 devices <ul style="list-style-type: none"> • On Device 1 <ol style="list-style-type: none"> 1. User Clicks "New Game" 2. User Enters a String with a length greater than 0 in "Your Name" Field and clicks next arrow 3. User retains Game ID for device 2 • On Device 2 <ol style="list-style-type: none"> 1. User Clicks "Join Game" 2. User Enters Game ID (Given from Device 1) in Game ID Field 3. User enters a string with a length greater than 0 in "Your Name" Field 4. User clicks next arrow 	Device 2 is placed on the waiting page with <ol style="list-style-type: none"> 1. User's name displayed 2. Game ID displayed
US_02	AC_02	AT_02_02	1. User Clicks "Join Game" 2. User Enters valid Game ID 3. User enters an invalid string (null) in "Your Name" field 4. User clicks next arrow	A prompt is shown indicating that the user needs to input a name.

US_02	AC_02	AT_02_03	<p>1. User Clicks "Join Game"</p> <p>2. User Enters Invalid Game ID</p> <ul style="list-style-type: none"> a. Empty String b. Random String that is not linked to any game <p>3. The user enters a valid or invalid string (null or not null) in "Your Name" Field</p> <p>4. User clicks next arrow</p>	A prompt is shown indicating that the game id specified is incorrect.
US_03	AC_03	AT_03_01	<p>1. User clicks "New Game"</p> <p>2. User clicks Next Arrow</p>	A prompt is shown indicating that the user needs to input a name.
US_03	AC_03	AT_03_02	<p>1. User Clicks "New Game"</p> <p>2. User Enters a valid string (length greater than 0) in "Your Name" Field</p> <p>3. User Clicks Next Arrow</p>	Waiting Page is shown with <ul style="list-style-type: none"> 1. User's name displayed 2. Game ID displayed
US_04	AC_04	AT_04_01	<p>Requires multiple devices</p> <ul style="list-style-type: none"> • A device to create a game • devices to fill all the roles <p>Assuming that a game is created</p> <p>1. User clicks "Join Game"</p> <p>2. User enters a valid string (length greater than 0) in "Your Name" Field</p> <p>3. User enters a valid Game ID</p> <p>4. User clicks next arrow</p> <p>5. All the user slots are filled (enough players join a game)</p> <p>6. User clicks "Start Game" button</p> <p>7. The user jumps into the "Background" page and clicks next arrow</p> <p>8. The user jumps into the "Role" page and clicks next arrow</p> <p>9. The user chooses a role in "choose your role page" that has not previously been selected</p>	The Role that the user selected is highlighted. (In the backend the user is tied to this role)
US_04	AC_04	AT_04_02	<p><i>Assuming the actions of AT_06 having completed step 8</i></p> <p>1. The user chooses a role in "choose your role page" that has previously been selected by another user</p>	Nothing Happens UI wise, the game is in a state as if the button has not been pressed.
US_05	AC_05	AT_05_01	<p><i>Assuming that the user is in a waiting room and the game is ready to start</i></p> <p>1. User joins the game or creates the game successfully</p> <p>2. The user jumps into the "Background" page and clicks next arrow</p> <p>3. The user jumps into the "Role" page</p>	The "Role" page is shown successfully by following the order.
US_06	AC_06	AT_06_01	<p><i>Assuming that the user is in a waiting room and the game is ready to start</i></p> <p>1. User joins the game or creates the game successfully</p> <p>2. The user jumps into the "Background" page</p>	The "background" page is shown successfully by following the order.
US_07	AC_07	AT_07_01	<p><i>Assuming that the user has been assigned a role and other users have finished the same process either.</i></p> <p>1. User clicks enter "start game" button and see the special role aim description</p>	A clear set of goals, with quantitative objectives in order to achieve each is shown.
US_08	AC_08	AT_08_01	<p><i>Assuming that the user has been assigned a role and clicked start game and also ready to enter to the beginning of each chapter.</i></p> <p>1. User clicks next arrow to enter into "chapter" page</p> <p>2. Chapter Story is displayed, user clicks next arrow</p> <p>3. "Your Information" page is displayed, user clicks next arrow</p> <p>Note:</p> <p>The test needs to be done for each chapter</p>	A prompt is displayed indicating that users need to discuss the decision as a group

US_09	AC_09	AT_09_01	<p><i>Assuming that the user has been assigned a role and clicked start game and also finished the prompts to support to make decisions.</i></p> <ol style="list-style-type: none"> User clicks next arrow and enters to "Group Decision" page <p>Note: The test needs to be done for each chapter</p>	<ul style="list-style-type: none"> A list of choices are displayed for the decision that needs to be made A timer is shown "Next" button is shown
US_10	AC_10	AT_10_01	<p><i>Assuming that the user has been assigned a role and clicked start game.</i></p> <ol style="list-style-type: none"> User clicks enter chapter button and the chapter description User clicks next arrow see "your information" User clicks next arrow and jumps into "Group Discussion" page User clicks "ready to discuss" button to start talking if it is his/her turn <p>Note: The test needs to be done for each chapter The test needs to make sure other users can hear the voice about the speaker</p>	The "ready to discuss" button works well for multiple users in each round(speaker can talk and others can hear clearly)
US_12	AC_12	AT_12_01	<p><i>Assuming that the user has finished all rounds and decisions</i></p> <ol style="list-style-type: none"> User clicks "end game" on the last of the game round page User clicks next arrow on the conclusion page User clicks next "reflection" on the outcome page 	A list of all decisions made throughout the game concerning that character will be displayed on "reflection" page.
US_14	AC_14	AT_14_01	N/A	A message will be popped up to notice whether the user to continue his/her choice or cancel
US_15	AC_15		N/A Determining whether the choices in the game present ethical grey areas is of the personal opinion of the users playing the game	
US_16	AC_16_01		N/A Determining whether the information that each user receives for their role is representative of how relevant the decision being made is to the character, is of the personal opinion of the users playing the game.	
US_16	AC_16_02	AT_16_02_01	<p><i>Assuming that the user has been assigned a role and clicked start game.</i></p> <ol style="list-style-type: none"> User clicks enter chapter button Chapter Story is displayed, user clicks next arrow "Your Information" page is displayed, user clicks next arrow "Group Decision" page is displayed, user clicks "Enter Choice" user selects choice and wait for other users finish their chooses confirm the decision by the user in the pop-up message 	The voted result will be displayed and the final group decision will also be displayed for each round
US_17	AC_17	AT_17	<p><i>Assuming that the user has finished all rounds and decisions</i></p> <ol style="list-style-type: none"> User clicks "end game" on the last of the game round page User clicks next arrow on the conclusion page 	The outcome will be displayed whether or not user achieved character goals or not, and it also reflect upon whether personal success, if attained, came at any cost to plot outcomes.
US_18	AC_18	AT_18	<p><i>Assuming that the user has finished all rounds and decisions</i></p> <ol style="list-style-type: none"> User clicks "end game" on the last of the game round page User clicks next arrow on the conclusion page User clicks next "reflection" on the outcome page 	Reflection information will be displayed with feedback precisely.
US_19	AC_19	AT_19	<p><i>Assuming that the user has been assigned a role and clicked start game.</i></p> <ol style="list-style-type: none"> User clicks enter chapter button and the chapter description User clicks next arrow see "your information" User clicks next arrow and jumps into "Group Discussion" page User clicks "voice" button to start talking if it is his/her turn User only can speak in a limited time 	The timer will start counting down until the end of the specified time