UNIVERSITY OF YORK

DEPARTMENT OF COMPUTER SCIENCE

Requirements

Group 20

Formerly Group 16

Group Members:

Group 16

Charlotte MacDonald
Hollie Shackley
Luis Benito
Kaustav Das
Sam Hartley
Owen Gilmore

Group 20

Leuay Dahhane
Max Irvine
Sam Butler
Flynn Gadsden
Jacob Wharton
Billy Moore

Introduction

Requirements were elicited and negotiated through the product brief and an initial client meeting. A product brief document was provided at the start of the project. This set out the story of the game and the interactions that the user must complete. It specified the control scheme of the game and the timescale for the play. Primary objectives for the users were laid out which were used to create user requirements. Items the game must include were set out which created a basis for requirements. How to successfully win the game was also defined which gave an initial idea of player goals which was important as players of the game will be stakeholders. We also identified the customer as an additional key stakeholder. This was used as a starting point to prepare a list of questions to take to the client and ask in order to get a better understanding of their aims and preferences for the project. The list of questions asked in the meeting can be found on the project website. Questions were split into topics to allow for in-depth discussion and follow-up questions were asked as they were thought of in the meeting. The client meeting crucially gave an insight into who the project was targeted towards and what the aim of the project was. It also allowed for features to be assigned priorities and made clear exactly what was and wasn't wanted within the project. The final question asked for any additional requirements that hadn't been discussed already to ensure that nothing had been missed.

This allowed a single statement of need to be formed: "The system shall enable users to play a game based on the life of a university student in which they have interactions that influence their score". User requirements and functional and non-functional requirements are discussed later in this document. They are presented through three tables - user requirements, functional system requirements and non-functional system requirements. Requirements were specified and presented by adapting the guidance given in IEEE 29148-2018 [1]. First, the stakeholder needs and goals as established in the customer meeting were refined to create user requirements. Following this, functional and non-functional requirements were established. To ensure they were well-formed requirements each functional requirement was a requirement that shall be met or possessed by the system to solve the problem and each non-functional requirement is possible to qualify by specific measurable conditions. Wording used followed the conventions specified. A referencing system was used to maintain traceability of all types of requirements. Requirements did not include design decisions or implementation ideas or suggestions.

In addition to these requirements, there were also a few constraint requirements. One was the project constraint of the timeline, the deadlines for this project being non-negotiable (the 21st March and 23rd May for the first and second parts respectively). The other was the design constraint of the game needing to run on Windows Desktop PCs.

User Requirements

ID	Description	Priority
UR-DEVICE	The game shall be playable on a Windows desktop/laptop.	Shall
UR-MENU	The game shall provide the user a main menu which they can use to navigate to different features of the application.	Shall
UR-CUSTOMISE	The user should be able to personalise their in game character.	Should
UR-WORLD	The user shall move their character around a 2D world	Shall
UR-CAMPUS-MAP	The user shall spawn on a map that is appropriately representative of Heslington. The user shall recognise that the map represents Heslington.	Shall
UR-TOWN-MAP	The user should be able to travel to a map that is appropriately representative of York town centre. The user should recognise the map represents York.	Could
UR-INTERACT	The user's character shall interact with objects/buildings within the world to complete tasks.	Shall
UR-TIMED	The game shall be timed so that the user plays through a sped up version of a week's worth of university life of the in-game student character. The game shall inform the user of the current in-game time.	Shall
UR-INFO	The user shall be informed of their character's energy levels and of their stats: the number of hours slept, the number of hours worked and the number of hours of recreation.	Shall
UR-ACHIEVEMENTS	The user shall be able to unlock achievements for completing certain combinations/streaks of tasks. For example studying each day may unlock a bookworm achievement.	Shall
UR-LEADERBOARD	The user shall be able to view a leaderboard with the name and score of the top 10 people who have completed the game (on a given device).	Shall
UR-SCORING	Upon completion of the game the user shall be given a score representing how well the user did in their exams.	Shall
UR-SOUND	The game may have music and sound effects.	May
UR-SETTINGS	The user shall access settings to control the volume of the music and sound effects.	Shall
UR-SLEEP	The user shall replenish their character's energy levels by sleeping.	Shall
UR-ACCESSIBLE	The game shall cater to users that are colour blind.	Shall
UR-DESIGN	The game shall have a happy/positive aesthetic and vibe.	Shall

Functional System Requirements

ID	Description	User Requirement
FR-VIEW	The system shall always use a top-down view point in	UR-WORLD

	the third-person	
FR-START	Starting the game shall allow the user to choose from a range of avatars	UR-CUSTOMISE
FR-INTERACTION-COllISION	When a player interacts with a building, they shall stay outside the building	UR-INTERACT
FR-INTERACTION-ACTION	When a player starts to interact with a building, there shall be a pop-up with text and choices	UR-INTERACT
FR-MAIN-MENU	Going to the main menu shall give the user the choice of credits, start game, exit game and audio settings	UR-MENU
FR-NOT-SAVED	Games shall not be saved	UR-MENU
FR-MENU-ON-ESC	Pressing esc shall pause the game and navigate to a pop-up menu with options to resume, navigate to settings or exit	UR-MENU
FR-NAVIGATE	The user using the arrow keys shall cause the player to navigate around the map	UR-WORLD
FR-SLEEP	Reaching the end of the day (16 hours) shall lock all other activities other than sleeping	UR-INTERACT
FR-ENERGY-DEPLETED	A player completing an interaction shall deplete their energy by a set amount	UR-INTERACT
FR-WEEK	The game shall end after a week	UR-TIMED
FR-TIME	A player completing an interaction shall jump the time along by a set amount	UR-TIMED
FR-DEVICE	The game should be able to be played on a Windows laptop or desktop	UR-DEVICE
FR-SLEEP-LOCATION	The player shall interact with one sleep location	UR-INTERACT
FR-STUDY-LOCATION	The player shall interact with at least one study location and make choices at this location	UR-INTERACT
FR-EATING-LOCATION	The player shall interact with at least one eating location and make choices at this location	UR-INTERACT
FR-RECREATION-LOCATIONS	The player shall be able to interact with at least three leisure locations and make choices at each	UR-INTERACT
FR-ENFORCED-ENERGY	The player shall be locked out of all activities other than sleeping if they run out of energy	UR-INTERACT
FR-MENU-OPTIONS	The menu shall provide the player with a list of options	UR-MENU
FR-COUNTER	The keep count of hours studied, recreational hours, hours slept and meals eaten	UR-INFO
FR-MOVEMENT-BETWEEN-MAPS	Where appropriate the player shall be able to move between maps by interacting with a relevant object (e.g a bus stop)	UR-WORLD
FR-TOWN-MAP	The player should be able to travel to a map representing York town	UR_WORLD
FR-CAMPUS-MAP	The player shall spawn on a map representing the university campus	UR_WORLD
FR-LEADERBOARD	Upon completion of the game the user shall be shown a leaderboard with the name and score of the top 10 people who have completed the game (on a given device).	UR_LEADERBOARD
FR-ACHIEVEMENTS	The user will be shown the achievements they have achieved after completing the game.	UR-ACHIEVEMENTS

FR-SCORING	The user should receive a score upon completion of the game, this should be displayed clearly.	UR-SCORING

Non-Functional System Requirements

ID	Description	User requirements	Fit criteria
NFR-ARCHITECTURE-PLAN	The game shall be accompanied by detailed architecture documentation		6 pages of architecture documentation containing diagrammatic representations and justifications shall be produced
NFR-CODE-DOCUMENTATION	The game code shall be commented and documented		>95% of code should either be self-explanatory or well-documented
NFR-MAP-LOCATION-RESILIENCE	A problem with one map location shall not impact other map locations	UR-INTERACT	In >95% of game plays that experience an issue with one location, all others will not be affected
NFR-SCALABILITY	The game shall support a single player at a time	UR-INTERACT	No more than 1 person will play in 1 game
NFR-NEW-USER-OPERABILITY	The game shall be playable by users with no prior experience of it	UR-INTERACT	>95% of users will find the game easy to understand even if they previously played for 0 hours
NFR-SET-UP-OPERABILITY	Users shall set up the game without needing training	UR-INTERACT	>95% of users will find the set up easy despite having 0 hours of training
NFR-COLOR-BLIND-ACCESSIBILITY	All game items shall always be distinguishable by shape as well as colour	UR-ACCESSIBLE	>95% of colour-blind users will be able to access the game
NFR-USABLE-ERROR-MESSAGES	Any technical error messages shall be hidden from the user and a user-friendly, plain English message shall be presented instead	UR-DESIGN	<1% of users will see a technical error message when playing the game
NFR-START-UP-RESILIENCE	The game shall be reliable and start as expected without being unavailable	UR-WORLD	100% of game starts will be successful
NFR-USABLE-GAME-INSTRU	All game	UR-DESIGN	100% of game instructions will be

CTIONS	instructions shall be provided in plain English and avoid technical and university jargon		in plain English with no jargon
NFR-SOUND-ACCESSIBILITY	No elements or instructions of the game shall only be indicated by sound	UR-ACCESSIBLE	100% of sounds and music will be supplemental and not necessary
NFR-NON-FAMILIAR-OPERABILITY	The game shall be playable by users who have had no experience of the game features in real life	UR-WORLD	>95% of players shall report that they found it easy to play the game even with 0 hours of university experience
NFR-MOVEMENT-BETWEEN-MAPS-USABLILITY	All users including new users should be able to move between the maps without specific instruction.	UR-WORLD	>90% of players shall report they are able to move between maps without instruction
NFR-PLAYER-SLEEP	After 16 game hours, the player shall be unable to do anything other than sleep	UR-SLEEP	After 16 hours of game time, players must be forced to sleep in 100% of cases
NFR-CONCISE	The game shall last between 5-10 minutes for an average player	UR-TIMED	>90% of players will play for a minimum of 5 minutes and a maximum of 10 minutes
NFR-CODE-UNDERSTANDABILITY	Team members not involved in implementation shall understand what is happening in the code		All team members will be able to understand the code within 1 hour
NFR-CODE-MAINTAINABILITY	A new team member (or one that has not previously worked on the code) should be able to understand and makes changes to the code		>90% of comments and code documentation must be understandable to new people immediately on reading
NFR-GOOD-REPRESENTATION-OF-UNIVERSITY	The game shall be appealing and present the university in a	UR-DESIGN	>90% of users should report that the design of the game was appealing

	happy and positive way		

References

[1] IEEE Systems and software engineering - Life cycle processes - Requirements engineering, IEEE Standard 29148 Second edition, 2018