Bilkent University

Department of Computer Engineering

Senior Design Project

Project short-name: TurnTheTables

PROJECT SPECIFICATIONS REPORT

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1   INTRODUCTION

In today's society, bullying has become a serious problem for everyone. Many educators and parents attach importance to a power imbalance among children having the potential to exhibit unwanted behavior while interacting with others. Since, personality formation takes place in school ages. Whereas there are some policies to address physical bullying, a number of children are under expression of psychological bullying. Both, kids who are bullied and kids who bully others struggle with negative short term and long term problems in their daily lives. The bullied victim can experience negative social and mental health issues including depression, anxiety disorders, social isolation, low self-esteem, feeling of shame and school avoidance [1][2]. There are also significant effects on the bully such as substance abuse, poor school performance and having difficulty in social relationships. The 2017 Youth Risk Behavior Surveillance System (Centers for Disease Control and Prevention) indicates that, nationwide, 19% of students in grades 9–12 report being bullied on school property in the 12 months preceding the survey [3]. Without proper treatment, the victims will continue to face such behavioral and psychological problems and potentially get worse, even engaging suicidal behaviors.

In attempt to come up with an efficient way of bully prevention, our application will propose a more interactive and strategic way of dealing with such a problematic social issue instead of standard methods. For our target group, we aim to comprise the infrastructure of how they can stand against bullying, defend themselves or receive professional support. With the advantage of various scenarios pointing to the interaction between children in a representative manner, our game will not only discourage school-aged children from violent behaviour but also encourage them to stop bullying by giving positive messages subconsciously.

In this report, a brief description of the project will be provided. Then, insight about the constraints surrounding implementation, economic, social, sustainability, ethical and time issues regarding the application will be given. Afterwards, the professional and ethical responsibilities the project brings along will be listed. Finally, all information about the functional and nonfunctional requirements of our application will be included in detail.

1.1 DESCRIPTION

TurnTheTables is a platform for children, where they are educated about bullying and how to stand against it. TurnTheTables provides a child-friendly 3D gameplay to children where they will interact with different characters and face various scenarios where they will directly or indirectly face bullying and will be educated on how to confront such a situation. The application will present the user with multiple events, where the main character is bullied or witnesses some other character in the game who will experience bullying, consequently the user will get various options, so as to react to that situation. In such situations the child will be encouraged and advised to step forward to stand against bullying, and consequently if the child does so, (s)he will be applauded, whereas, if (s)he does not, then they will be discouraged.

This app will also psychologically analyze the character of the child and determine if they are bullied or could potentially be bullied in real life. This will be done by evaluating how the child reacts to the bullies in specific scenarios. The evaluation of a child's behaviour will be conducted by effective bullying psychology surveys, provided by the Psychology dept of Bilkent University. These surveys will be used to create scenarios in the game that reflect the nature of the questions in these surveys. The actions taken by the child on these numerous circumstances will act as the answers to the survey and as a result, provide a detailed analysis of the child's character, which will be sent to the parents by mail at the end of the game. This is done, in order to inform the parents about mental health of their child and involve them in the process of their child's psychological welfare and so they can support their child in this phase of life. In addition to sending the analysis of a child's behaviour, the app will also provide instructive messages to the child throughout the game to educate the child about the detriments of bullying, as well as, how to correctly respond to a situation where they encounter bullying. All educational messages, provided during the gameplay, will be according to the recommendations of psychological experts. Therefore, the child will be subconsciously taught that bullying is a contemptible act.

1.2 CONSTRAINTS

1.2.1 IMPLEMENTATION CONSTRAINT

- The application will be implemented for Android, IOS and Desktop platforms.
- Unity 3D will be used for creating a 3D model of the surrounding environment.
- Blender and Maya will be used for creating animations.
- Github platform will be used for making a collaborative contribution to our game.
- Open source libraries will be used in development of the software.
- Ready-made models will be bought from online stores or CC models will be used.
- C# will be used as the language for development.
- Object Oriented programming will be followed for the development.
- Surveys from third party sites, which will be directed by the Psychology Dept at Bilkent, will be used as references.
- A website will be created and maintained for observing the status of our project.

1.2.2 ECONOMIC CONSTRAINT

- A domain for our website will be bought.
- We need to buy models from various stores such as Unity3D's asset store, sketchfab, cg trader.

1.2.3 SOCIAL CONSTRAINT

- Different cases based on today's society while creating a number of scenarios, will be considered.
- For the children who are unable to read, the application will offer an option of voice button.

1.2.4 SUSTAINABILITY CONSTRAINT

- The application will be updated frequently to provide performance enhancement.
- Different scenarios will be added to keep the game up-to-date according to the psychological effects of the app on children.

1.2.5 ETHICAL CONSTRAINT

- All activities carried out will abide by the Code of Ethics put together by the National Society of Professional Engineers (NSPE).
- All instructive messages provided during the gameplay will be according to the recommendations of the Psychology Dept at Bilkent, to avoid any sort of unethical scenarios, which may adversely affect the psychology of a child.
- All scenarios will be created according to the psychological research conducted and following the guidance of the instructors of Bilkent and Hacettepe Universities' psychology departments.

1.2.6 TIME CONSTRAINT

- The application is aiming to psychologically educate children on how to pose an attitude against bullying. Thus, observing the effects of the scenarios in the game over children could take time.
- The project must be completed until the deadline.

1.3 PROFESSIONAL AND ETHICAL ISSUES

As we are building an application that has an effect on child psychology, we must regard its ethical impacts. The game will contain messages that can be transferred through verbal and physical ways. We do not want to manipulate children to undesired manners. Therefore, we decided to consult people that are specialized in child psychology and child development. We plan to get in contact with some experts from Bilkent and Hacettepe University. The scenarios will be prepared according to their advices. We will also get help when we analyze the actions of the player. Therefore, we prevent the misbehavior of the children.

The game can be saved and then can be re-loaded. Therefore, the user's actions and analysis will also be stored. We will not use online database systems to store user data. In order to preserve privacy of the player, the data will be stored on the player's device.

In order to prevent misuse of the application, there will be an age limit. Children who can not pass the age limit have to play the game under surveillance of his/her parent. The age limit will also be determined by the psychologist.

2 REQUIREMENTS

2.1 FUNCTIONAL REQUIREMENTS

- The user must register to the game and fill the required information such as name, age, gender and so on.
- The user can change the registered information.
- After registration, the user can start a new game or load the saved game.
- The game should start in a school campus.
- The environment of the game should be designed according to psychological aspects. (For example, red colored walls could lead the child to take more daring actions [5])
- The game can be saved during playing the game or exit time.
- The user can close the game whenever it is wanted.
- The game could be paused by the user.
- The user can control and move the game character in the campus.
- There should be other characters which the user can interact with.
- The user should be given different options in the events she or he encounters throughout the game and when interacting with other characters, so the user will be able to decide his/her actions.
- The game should consist of psychological messages which will educate the child's subconscious.
- The game flow and the demeanor of the other characters towards the main character should change according to the user's decisions.
- The application will not require internet connection.

2.2 NON-FUNCTIONAL REQUIREMENTS

2.2.1 USABILITY
- The application will be user friendly.
- User interface will be simple and understandable for the children.
- The game will have enjoyable graphics for children.

2.2.2 COMPATIBILITY

● The game can be played on IOS and Android devices, and Windows desktops.

2.2.3 PERFORMANCE

● The user will not wait long when he/she enters another building or exists the entered building. Thus, changing place of the player will be fast.

2.2.4 SECURITY

● The information of the player will be stored on only the player's device. The information won't be accessible on another devices.

2.2.5 RELIABILITY

● Psychology is a sensitive field, thus the scenarios will be confirmed by psychologists and will be ensured to not make erroneous impacts on the child's subconscious.

2.2.6 TESTING

● The outcome of the behaviour of the player will be evaluated according to the psychologists' methods.
● The scenarios in the game will be tested one by one to verify whether they are having correct outcomes in the game.

2.2.7 EXTENSIBILITY

● New psychological scenarios could be added to the game when new related psychological methods are published.

2.2.8 EFFICIENCY

● The game aims to educate children on how to defend against bullying and how to behave when they encounter bullying, thus the game should efficiently give accurate psychological messages to achieve this goal.

3 REFERENCES

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[4] *Misdirections in Bullying Prevention and Intervention*. www.stopbullying.gov/sites/default/files/2017-10/misdirections-in-prevention.pdf.

[5] Ciotti, Gregory. "The Psychology of Color in Marketing and Branding." *Help Scout Blog*, 1 Mar. 2018, www.helpscout.net/blog/psychology-of-color/.