Percussive Art Society
Jump N Bump Videogame

Team members
Adrian Bravo Lopez A01752067

Alan Said Martínez Guzmán A01746210

Alberto Jashua Rodriguez Villegas A01752023

David Damian Galan A01752785

Sandra Ximena Tellez Olvera A01752141

Teachers
Marciano Alberto Moreno
Roberto Martínez Román
Ma. Carmen Jiménez
Humberto Cardenas Anaya

TC2005B - Software Construction and Decision Making

Campus State of Mexico

Problem description

During the first PAS presentation, they told us about 2 principal problematics:

1- Injuries during long time exposition to high decibels

2- Physical injuries during practicing caused by bad warm-up

According to this, we receive the task to create a video game to raise awareness of the importance of taking care of artist´s ears, just to prevent injuries, by simulating 3 different levels of hearing loss.

Overview of the proposed solution

We develop a platform video game that try to raise awareness of the importance of taking care of our ears, especially when you are a percussionist.

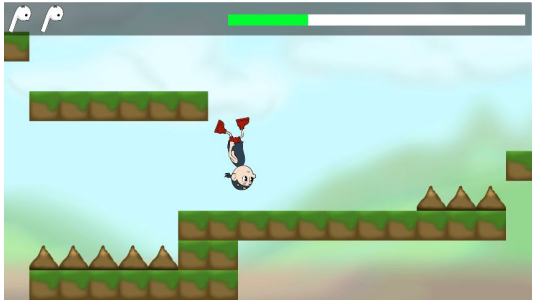
The video game has genres platforms and rhythm, since you have to follow the music. Each time you make a mistake, you will “lose” the capacity of optimal hearing.

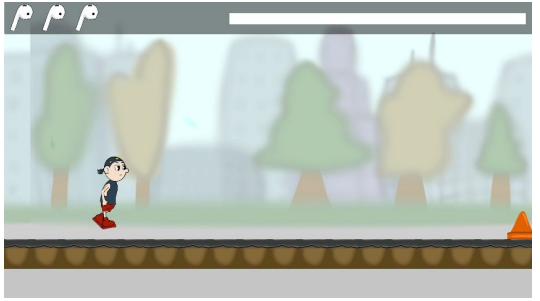
This video game sends data to the cloud about the player and the attempts made, so the organization will be able to take decisions according to graphs presented by analyzing the data.

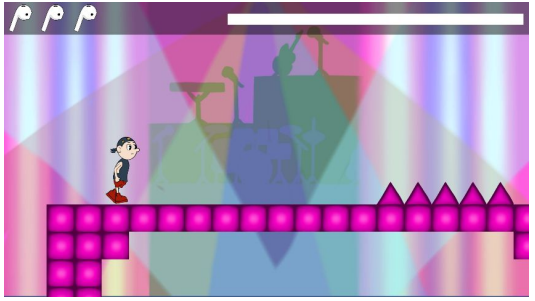
Functional specification

Video game

The video game consists of 3 levels with increasing difficulty. The main character can do 3 movements, which are jumping, inverting gravity and restoring gravity. This set of actions allows the player to follow the rhythm of the background music in each level.



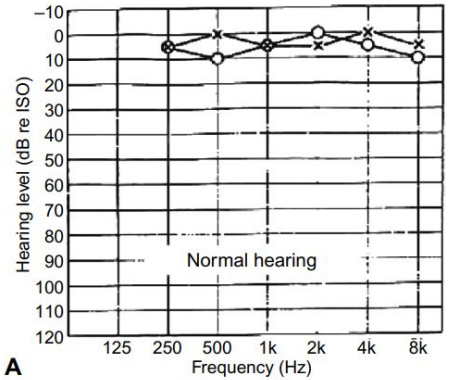


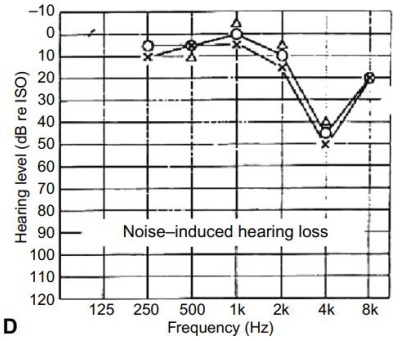


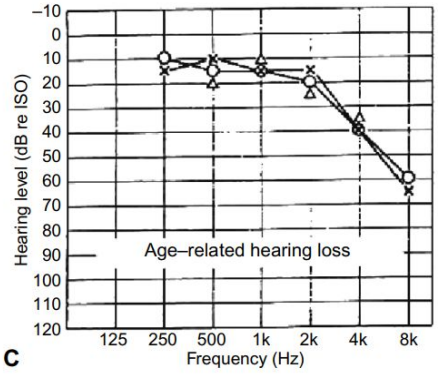
Functional specification

Video game

The player has 3 lives for each attempt in the game. Lives are corresponded with a representation of a level of sound hearing loss reflected in the music. This music was equalized following an audiogram to simulate the hearing from a person with hearing loss[1]. The less lives the player has, the worse hearing loss will be.





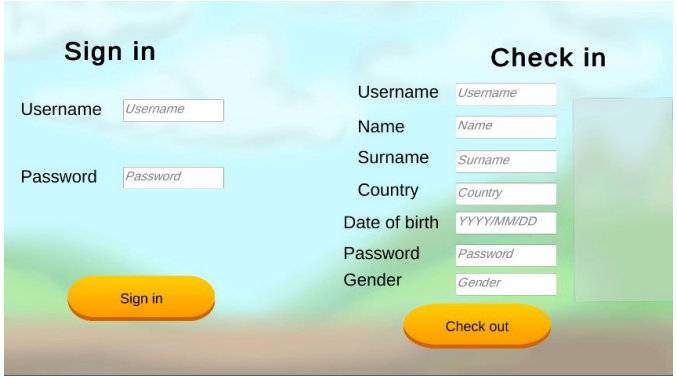


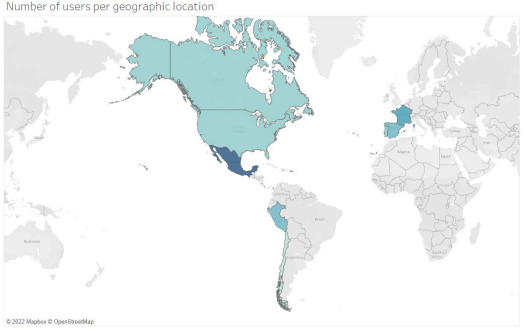
[1] Davies, R.A. (2016). [Handbook of Clinical Neurology] Neuro-Otology Volume 137 || Audiometry and other hearing tests. 157–176. doi:10.1016/B978-0-444-63437-5.00011-X

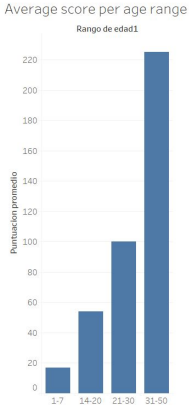
Functional specification

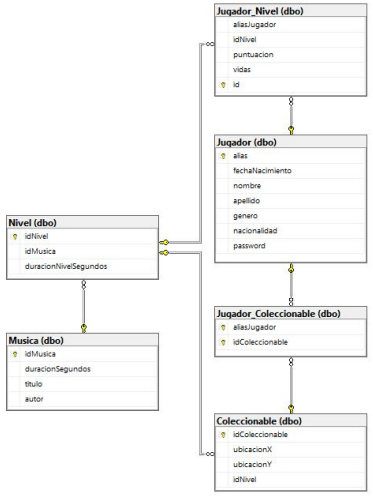
Web server API, Database and Data Visualization

The web server allows Unity to communicate with the system database, to retrieve and update information about the login, attempts and the user. This information is then analyzed to generate useful insights to the organization.









Technologies used

Video game: Unity Platform, C#

Web Server (API): Node.js, Express.js

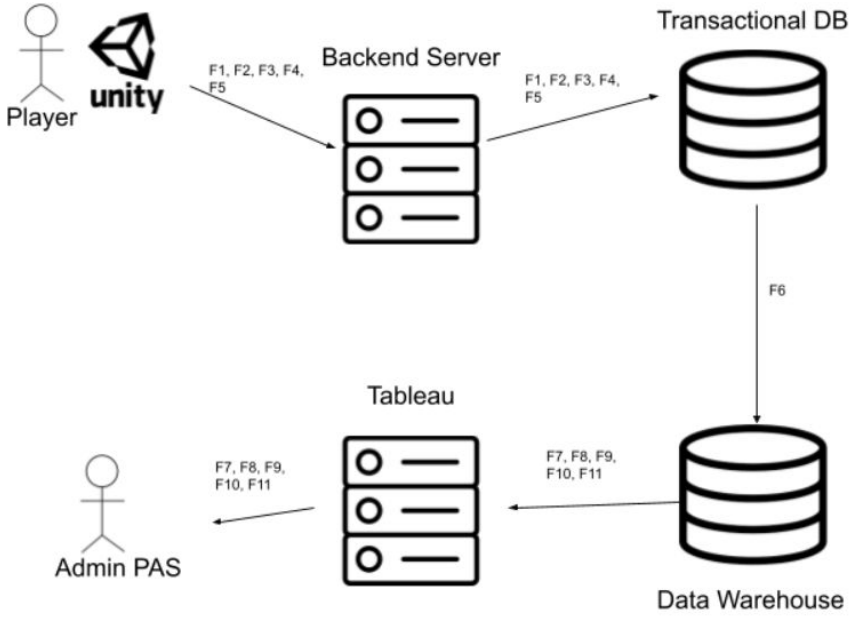
Database Server: Microsoft Azure SQL Server

Data Visualization: Tableau, HTML, CSS

System architecture

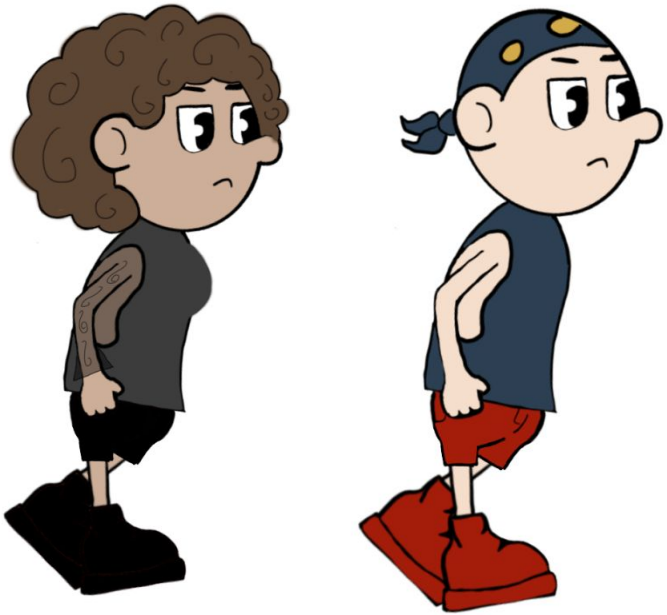
The video game in Unity Platform makes requests to the backend server, which holds communication to insert and retrieve data from the database.

The data stored is transferred to the data warehouse, where it is transformed into valuable information. Then tableau is used to visualize the data in the form of graphs to support the decision making of the PAS Admin.



Improvements to the system

As the organization suggested, a good improvement to the system would be to include a female character, since it is assumed that percussionist are men, but this is false. There are also a lot of female percussionist. We could increase the inclusion players by adding this character and let players know that women can also be percussionists.



Summary of amount of effort

Analysis of the problem and inception of the solution: 10 hours

Game development: 60 hours

Web server development: 16 hours

Database creation and management: 30 hours

Documentation: 20 hours

Total: 136 hours

Conclusion

In the 10 week period we had to make this game possible we learned how truly complex the development cycle of a product is and how to better manage our resources and time to better complete our tasks. We also came to understand how important it is to create tools to facilitate the learning and development of new skills that will help others in the future, in this case it just so happened that our tool was a video game. We also learned how important it is to take care of loud noises, the ear is the best resource a person can have if that person will dedicate his life to an instrument or not. Finally we concluded that most applications and software nowadays aren't only composed of the coding of the product in itself but also is made of many other parts working together such as a web server to send data and visualization of this data through a web page.

Links of the project

http://165.232.147.208/

https://github.com/Adrian101-hnd/Jump_n_Bump