CAPSTONE 2023

Vaccine Games For Teens

MEDICAL GAMING SOLUTIONS

Leveling Up Healthcare Through Gaming

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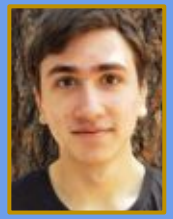

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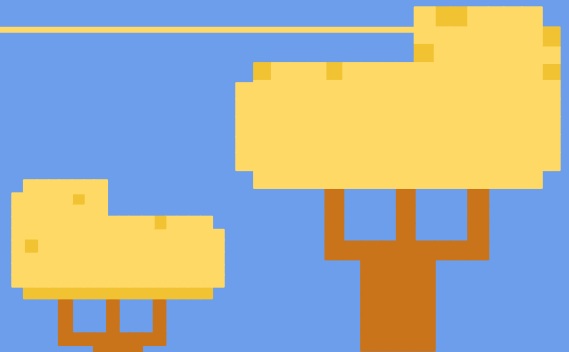

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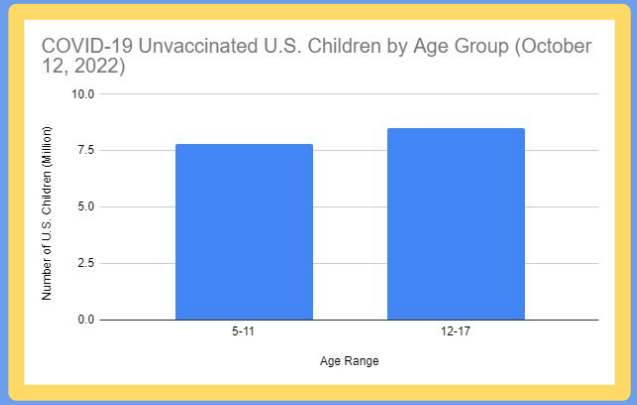
PROBLEM

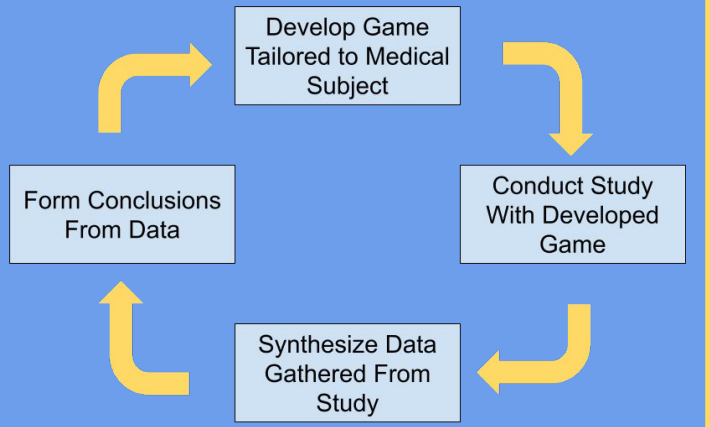
PROBLEM

- In Arizona, 60% of individuals under 20 remain unvaccinated against COVID-19
- HPV prevalence is on the rise, posing severe long-term health risks
- Our project, led by Dr. Amresh, aims to utilize gaming to promote vaccination awareness
- By integrating gaming, we strive to engage and educate teenagers about the significance of vaccinations in healthcare



PROBLEM

- No ongoing studies that target adolescent vaccination rate improvement (COVID-19 and HPV)
- Gap of literature on teens' decision within a game environment when faced with the ability to control the outcome
- Developers should be given a framework to quickly create video games for a clinical setting



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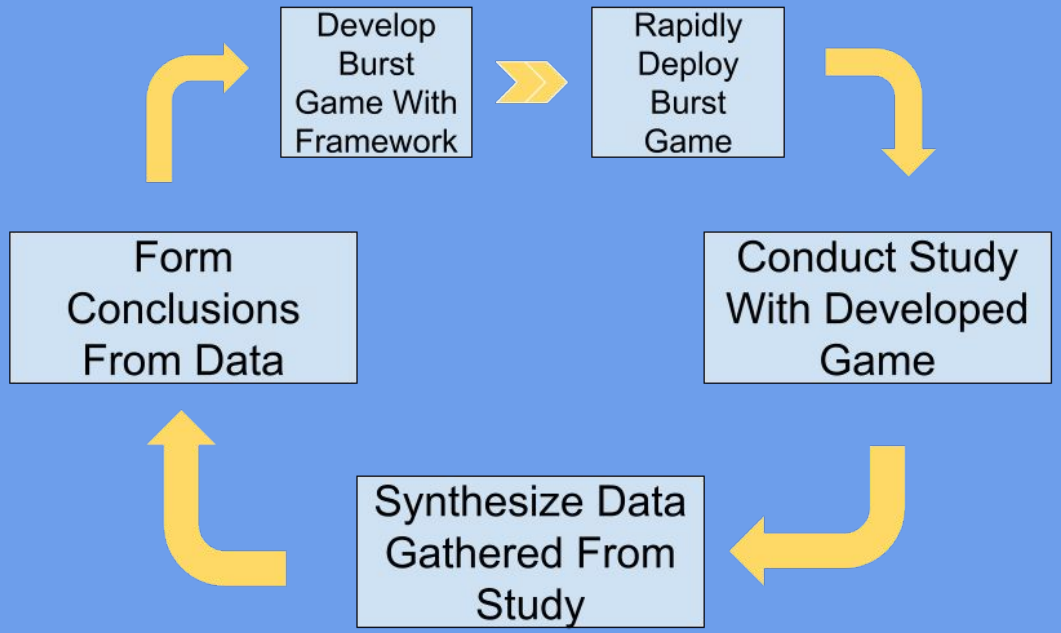
Solution Overview

VIDEO GAME FRAMEWORK



SOLUTION FEATURES

- Various game genres
  - Infinite runner
  - Puzzle game
  - Collect/grow game
- Data management
  - Create and save player data

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Key Requirements

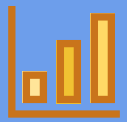
Requirements Acquisition

Aligned Our Goals

Requirements must allow for developers to create burst games and researchers to collect data

Set Limitations

Players will only have a short timeframe to try the game, and are restricted to playing in a clinical setting



Meetings With Our Client

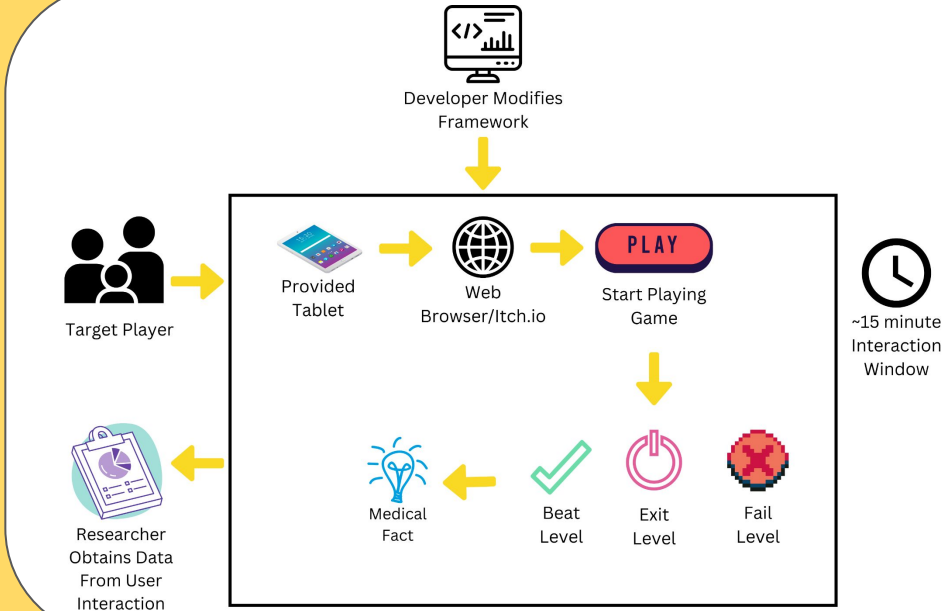
Dr. Ashish Amresh would help guide us to layout the requirements needed for this project to work

Example Burst Games

The burst style genre has been done in many different styles that we've all grown up playing and took inspiration from

Key Requirements

- Developers can easily customize content in framework
- Games are accessible and playable via tablet
- Fast paced process for limited time frame



- Behavior change in medical domain from Players
- Researchers can collect data from players actions

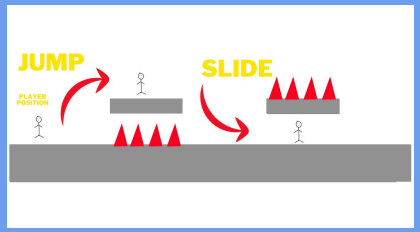
High Level Functional Requirements

Knowledge Drop Components:

Provided customizable components for developers to display their own content related to their desired domain

Game Mechanics:

Gameplay features for the specific genre of game the developer wishes to create



Data Management:

Gives components the ability to manage and access data from other components, allowing researchers to view data from the players

- Data Management

Sub levels of data management:

Score Data:

- High Score
- Current Score
- Leaderboard

Character Data:

- Position
- Power Up

Research Data

Consent Form

Developers can swap in their own digital consent form for players to fill out, giving clinics value in reducing time with handing out and waiting for forms

Research Component

Tracks amount of times a specific action was taken by the player that researchers can then use to analyze (door opened, enemy destroyed, etc.)

Performance and Environmental Requirements

Optimization

Framework should run fairly fast with simplicity to reduce overworking devices

Compatibility

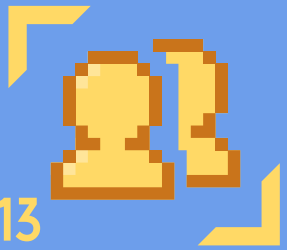
Must be able to run on recent versions of tablets and browsers

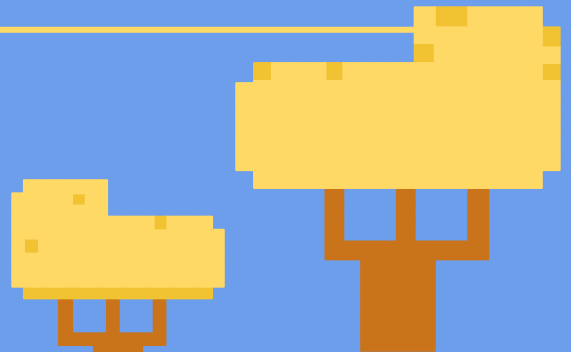
Unity

The framework will be built upon the Unity game engine

Clinical Setting

Work within limitations of the tablet and the clinical area





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RISKS AND FEASIBILITY

Risk and Feasibility

Risk 1: Computing Intensity

- Description: System's computing intensity may limit playtime on clinical tablets
- Likelihood: Moderate
- Mitigation: Frequent resource benchmarks to prevent inefficiencies

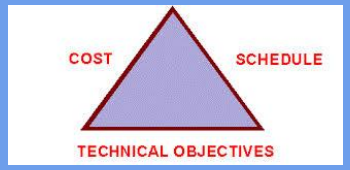
Risk 2: Undocumented Dependencies

- Description: Undocumented dependencies will lead to compatibility issues
- Likelihood: Moderate
- Mitigation: Implement a strong dependency tracking system

Feasibility:

- In-depth analysis outlined in our Feasibility Report
- Makes Sure we are in alignment with our goal to enhance vaccination rates as well as creating awareness

Project Schedule



December 5, 2023

Requirements Specification Document

November 15, 2023

UML Diagram

November 30, 2023

Design Review

Purpose: Communicate accomplishments, current status, and outline remaining tasks

December 5, 2023

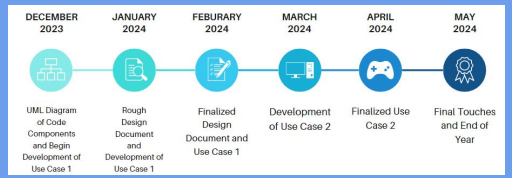
Technical Demo

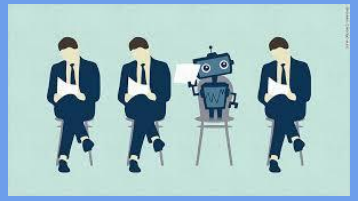
Purpose: Live demonstration of a proof-of-concept for our framework

April 2024

Two Use Cases

Deployment: Games hosted on itch.io





Conclusion

Project Significance

- Addressing Critical Health Issues
- Improving COVID-19 and HPV vaccination rates among adolescents
- Potential impact on symptoms, long-term effects, and fatalities related to viruses

Solution Overview

- Development of a Game Framework
- Framework facilitates fast-paced, engaging burst games for clinics
- Aim is to to make game development, analytics, and maintenance efficient

Risks and Mitigations

- Risks Addressed
- Computing intensity and undocumented dependencies
- Regular benchmarks and a robust tracking system mitigate these risks

Looking Ahead...

- Next Development Phase
- Building on the outlined framework, focusing on detailed functionalities
- Excited about the potential positive impact on vaccination rates and addressing the ongoing pandemic

THANK YOU