

Pandemic Survival: *Educating about the COVID-19 Pandemic*

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Abstract - Games are usually considered as a trite activity for the youth. However, the successful researches in game design and development over the last few decades have revealed that they can prove to be valuable tools for growth and connection. Exploring the ways digital games can be used as tools for connection has gained increased attention in recent times as a result of the COVID-19 pandemic. This paper proposes a two-dimensional Augmented Reality game titled “Pandemic Survival” that helps in spreading awareness about the effects of Coronavirus on the physical and mental health of an individual. The primary aim of the proposed work is to educate people about safety precautions to be taken to deal with the pandemic while staying indoors or travelling outdoors. Through various gameplays and element design, the utility of maintaining social distancing, using masks and sanitizers, taking dosages of vaccinations etc have been implemented so that players, especially youth and children tend to learn and acquire knowledge of fighting back with the virus attack in a fun-filled manner.

Keywords – COVID-19 pandemic; Digital Games; Unity Game Engine; Vaccine; Engineering Education; Social Awareness

1. Introduction

People right now are thinking that the entire COVID-19 situation is under control. Everyone feels that the threat is gone, which is not true in reality (World Health Organization, 2022). This mentality is rather harmful for everyone, we cannot afford to keep our guard down against an unpredictable virus that has forced the entire world to come to a standstill even though we were in a quite advanced stage in the fields of medical science and technology (or so we assumed).

The anti-bodies generated within our body against this virus is effective but for a certain period of time and coupled with ridiculous fast rate of mutation of this virus, it will in the interest of everyone to get vaccinated at regular intervals because till date nations across the globe still have to call for complete or partial lockdown to control the spike in infections.

Social Media platforms are great avenues through which awareness related to the ill-effects of the pandemic can be spearheaded and people across the globe be reached and subsequently educated. People use platforms like Facebook and Instagram extensively and so by getting all the users of the platform to play the game developed by our team, we will be able to channelize and streamline the awareness drive and use the platform of entertainment consummately.

This led to the germination of the thought of developing an Augmented Reality (Cipresso et al., 2018) game which will enhance awareness about COVID-19, aid people understand the

necessity of getting vaccinated and will persuade them in getting themselves and their near and dear ones vaccinated.

2. Related Works

There are a handful of games already being developed by various developers world-wide to address the grim situations brought about by the COVID-19 pandemic. One such game include the Antidote Game that teaches players to stay safe from the virus (World Health Organization, 2021). WHO and Psyon Games have joined forces to launch a new tower defence game called the Antidote COVID-19 to turn complex, scientific information into a fun learning experience. During the course of the game, players will learn about their immune system, pathogens, vaccines and how to protect themselves from COVID-19. This game has been developed at a critical point of the pandemic where misinformation is hindering the COVID-19 vaccine acceptance and adherence to other public health measures due to fear, mistrust and doubt. By putting players in the driver's seat, the game urges everyone to play a role in fighting harmful misinformation online, and learning and sharing the facts from trusted sources of information. The game starts just before the pandemic begins. The player is recruited to halt the spread of SARS-COV-2, the virus that causes COVID-19, by developing vaccines and helping the human immune system fight off the virus. Based on real events, this online adventure takes the player to the frontline of science, ultimately providing lifesaving information in the palms of their hands.

Students at the Indian Institute of Technology Madras have developed a digital game "IITM COVID Game" to create awareness among the general public, particularly children, on the importance of following COVID-19 protocols (The Hindu, 2020). This game downloadable from IITM's website (DOST, 2020) is browser-based and can be played on any device, including personal computers, laptops, tablets, and mobile phones, among others, as per the IIT Madras' official release. The students have also translated the game to several Indian regional languages to maximize its reach, including Bengali, Gujarati, Hindi, Kannada, Malayalam, Marathi, Punjabi, Sanskrit, among others.

3. Proposed System

The proposed work is in the form of a two-dimensional (2D) Augmented Reality (AR) COVID-19 game named "Pandemic Survival". This game has a Mario-like 2D platform, but the environment, obstacles, enemies and also the objective is quite different, which is set on our experience regarding the pandemic scenario and how we can survive it. The game is a recreation of our real-life situation of pandemic survival but with a bit of fantasy merged up with it to provide a refreshing experience to the players, especially youth.

The gameplay is to have a human character that would refer to the player playing the game, who will go through various game sequences, phases or levels and hurdles where each level describes the different waves of COVID-19 pandemic viz. the First, Second, Third waves and so on that humans across the globe had to face. Strategically speaking, the 1st level of the game, which is the reminiscent of the First wave of the pandemic, has all the struggles of society summed up within it such as the vaccine scarcity and later on a vaccine necessity and so on. Interestingly, those problems faced by people were the challenges of the real-world that include real-life elements whereas the elements of fantasy as demonstrated through the proposed game denote the various facts related to the vaccination drives and vaccines give the player a power-

up signify its importance. And the fact that Coronaviruses are a personification of bad guys in the story of a human's life is portrayed beautifully to give players a fascinating story to look up to.

The proposed game "Pandemic Survival" has been developed using the following elements:

- 1) *Target Platform:* The target platforms on which the game can run are Personal Computers (PCs) that are either Windows OS-Based or Personal Digital Assistants (PDAs) that are Android/iOS-Based. For PCs, the devices that needed for experiencing the game is nothing but a working keyboard and for mobile devices there is an on-screen touch-based joystick. Compilers are used in the game development in-order to support our ambitions.
- 2) *Development Tools:* The platform for developing this game is provided by none other than Unity Game Engine (Unity, 2022). And the language used is C# as Unity uses C# for all its code related works. For designing the game characters and every other element for world building apart from the logic mechanics, we have used the Adobe Photoshop software (Adobe, 2022) and Blender 3.2.2 software (Blender, 2022) is used for 2D Sprite Designing. Moreover, free asset materials have been gathered from online sources.

The workflow of the proposed game "Pandemic Survival" and the story that it puts across has been depicted through a flowchart in Fig. 1.

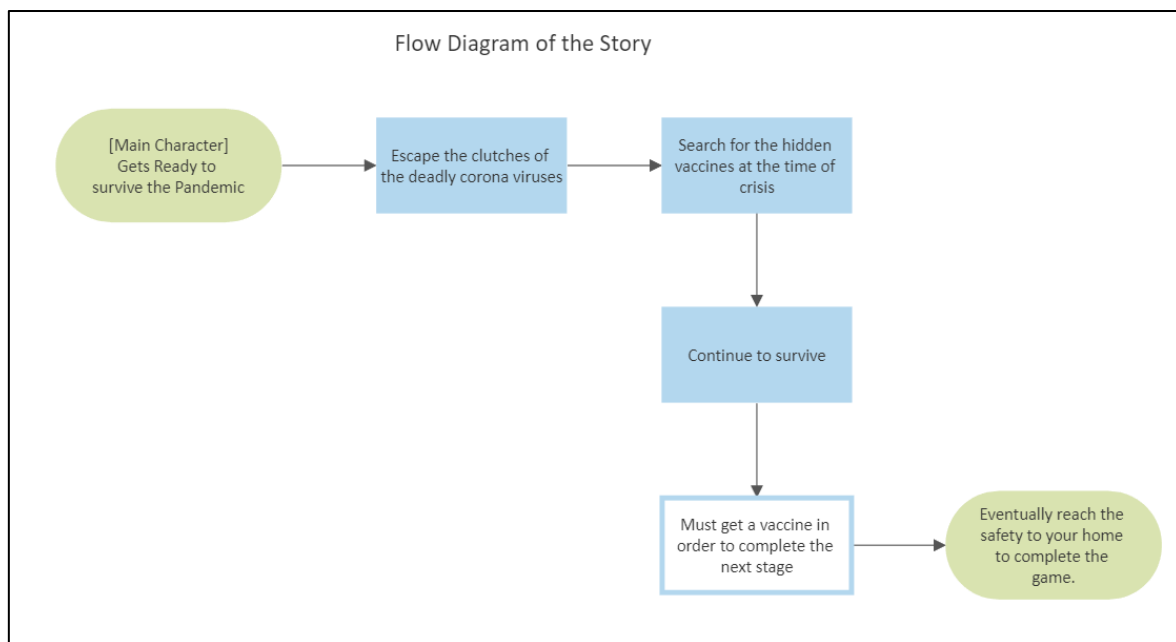


Fig. 1 Workflow of the Proposed Game titled "Pandemic Survival"

4. Implementation & Result

The screenshots of the User Interface (UI) design of our game prototype is illustrated through Fig. 2 and Fig. 3. The vaccine (see Fig. 4) gives our player (or game character) certain powerups or rather say a buff as found in video games just like in the real world. Similar to the real-life effects of the vaccine, in the game as well the vaccine does not provide full immunity to the player but rather a shielding effect is created and certain additional boost like an enhanced movement speed is implemented.

Upon combining all the various other aspects of the game, it can be said that presently an alpha-beta phase has been reached where the actual purpose of educating the youth about the effects of COVID-19 and how to deal and mitigate it have been aptly demonstrated and depicted.



Fig. 2 Screenshot showing the Title Screen of the Proposed Game



Fig. 3 Screenshot showing Level 1 Screen of the Proposed Game



Fig. 4 The Vaccine Element of the Proposed Game for activating the Powerup Mode

Many aspects of handling the COVID-19 pandemic bear a resemblance to patterns found in games. We have integrated and deployed in our game point displays and leader boards, the

visible assumption of roles, classic archetypes, the collection of resources, and spatial awareness. It is well understood that these patterns manifest spontaneously as a form of analogical reasoning, because people lack cultural and individual norms as well as cognitive scripts for dealing with a pandemic of such magnitude. Trying to find systematic similarities between a novel and a familiar situation is an essential cognitive strategy and a cultural tool, resulting in a spontaneous ludification of this crisis. Unfortunately, most of the institutions, media and policymakers focus on attributes that are easy to communicate, not on relations and causal chains. This results in shallow analogies, where the mechanisms and dynamics of COVID-19 are not addressed. This can cause a sense of helplessness, where many people remain passive viewers. A pandemic, however, calls for cooperative action of people who understand the relations between different factors and stakeholders in order to mitigate several negative effects linked to such a crisis. We propose a psychologically founded “Strategic gamification” (here in the context of a pandemic), a form of sense-making that builds on spontaneously emerging ludic elements. By extending upon those elements through the lens of game design, we can shape the mechanics, dynamics and aesthetics of a serious context in a more meaningful way. The resulting analogies have better predictive power and are suited to utilize positive aspects of gamification like engagement, elaboration and collaboration. Our goal is to enhance awareness among all people, especially children and youth through a fun-filled gaming experience on how to deal with the COVID-19 pandemic with more robustness and alertness.

5. Discussion & Analysis

Pandemics have threatened human race many a times. One of the most important tasks during a pandemic is to bring awareness among people. Bringing awareness contributes a lot in controlling any pandemic. COVID-19 has been causing severe loss to the human race. Considering the mode of spread and the level of severity of this disease, it is extremely important to make people aware of various safety precautions such as using sanitizers and masks and maintaining social distancing, that are to be followed to prevent the disease and break the chain of spread. This mode of educating individuals about the disease is being widely carried out as announcements through online or physical awareness campaigns, advertisements in the media and so on.

The following lists the advantages of the proposed work:

- 1) Games are addictive to humans of the present period. It provides a form of refreshment after a person’s daily toil of work.
- 2) Now since the world of gaming is ever evolving and thus this growing attractive platform is essentially a best target for spreading awareness.
- 3) There are doubts as to how effective would it be, well a year-old popular game named “Ghost of Tsushima” had great monument of Japan which in real world was nearing its extinction in the form of ruins. So, players from all over the world generated fund for the restoration of that monument, which easily explains just how impactful games can be.
- 4) Children will learn about importance of vaccines and everything necessary for staying healthy and fit in a world where the Corona virus does not seem to be gone from our lives.

With all the positive things being said, the game proposed through this paper suffers from the following challenges as well:

- 1) Games cannot force the idea of awareness within a person. It is through playing and visualizing the concept that the idea can spread within people.
- 2) Games are addictive and it might result into a negative thing if a person gets addicted to it and hampers his/her studies or diurnal duties.
- 3) Further development or enhancement will require revenue because a bigger ambitious project will require advanced machines and technologies to make it popular and a grand success.

6. Conclusion & Future Scope

The younger generations in the present day spend considerably more time on mobile phones and games. However, there are very few mobile applications or games, aimed to bring awareness about a pandemic, which is much lesser in case of COVID-19. Also, considering the lockdown scenario across the world, games also act as a good pass time indoors. Hence, we have proposed a 2D survival based game- "Pandemic Survival", aimed to educate people about safety precautions to be taken for COVID-19 outside their homes, by incorporating social distancing and usage of masks and sanitizers in the game.

As we are social entrepreneurs, our primary goal is to alert people about the COVID-19 pandemic and make everyone aware about its symptoms, effect of Coronavirus on health, role of vaccines in safeguarding us from the ill-effects etc. So this game is launched so that everyone can play it free of cost. For the time being, we have developed a 2D game. We have plans of creating a 3D game in future which will be more realistic and more fascinating with some new novel mechanics within it. The story would be more fascinating and something that no one would have experienced before. And if we are able to be successful in this industry then we might be able to generate revenues using which we can take our social entrepreneurship to a much larger scale.

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