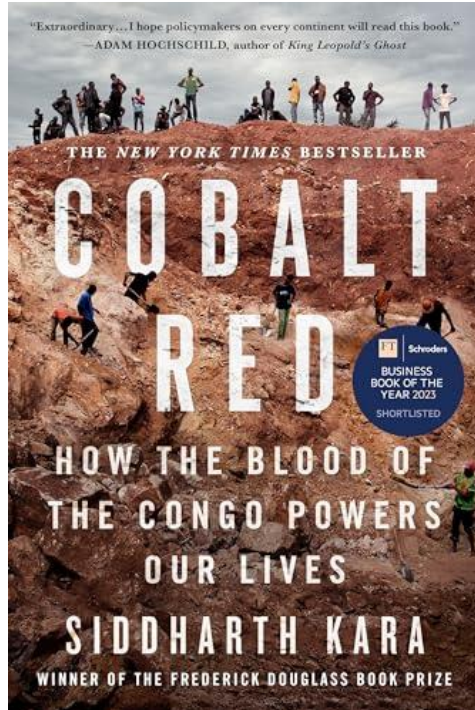# Toxic Tech : A Mobile Saga

Game for a Social Cause

~ Vraj Parikh and Aneeket Yadav

Motivations for the Cause

The primary motivation for the game came from the book -
Cobalt Red: How the Blood of the Congo Powers Our Lives by Siddharth Kara which investigates the human rights abuses and environmental impact of cobalt mining in the Democratic Republic of the Congo. Cobalt is a mineral that's essential for making the lithium-ion batteries that power our phones, laptops, and electric vehicles.

Every time we use our phones, which must be hundreds of times a day, we are hardly aware of harsh realities of those whose blood and sweat makes it possible for us to lead such comfortable and carefree lives. This therefore warranted attention.

Motivations for the Cause

Worker suicides in Chinese factories have been a poignant issue, shedding light on the harsh realities of labor conditions and mental health challenges faced by many workers. Often attributed to long hours, intense pressure to meet production quotas, and poor working conditions, these tragic incidents have sparked debates about the ethics of global supply chains and the responsibility of corporations towards their workers.

The marketing of phones as status symbols has created a consumer culture where owning the latest and most expensive device is often equated with social status and success. This marketing strategy plays on people's desire to fit in and be perceived as affluent or trendy, driving them to purchase new phones even when their current device is perfectly functional.

The constant bombardment of advertisements showcasing newer models of mobile devices as must-have items leads to a cycle of unnecessary consumption and environmental impact as older devices are discarded prematurely. The disposal of e-waste is not always done in effective ways, causing both human-health and environmental damage during their disposals. Either they pile up in large landfills causing large-scale land degradation, or are treated in ways that cause air and water contamination due to the release of harmful materials.

Gamification of Cause

We sought to raise awareness about the social cause by tracing the lifecycle of the most recognisable electronic device - the smartphone. Instead of performing good deeds in the game we decided to use the technique of 'reverse psychology' in order to generate empathy for the exploited parties:

1. **Cobalt mining** : Click on the tired labourer to keep him working
2. **Assembly in factory** : Save the workers trying to commit suicide so that the production does not stop
3. **Phone store** : Satiate the maddened crowd by throwing smartphones at them
4. **E-waste disposal** : Prevent the e-waste from falling into the landfill by salvaging it in environmentally destructive methods

   This allows a simple yet meaningful gameplay.

Screenshots from the game
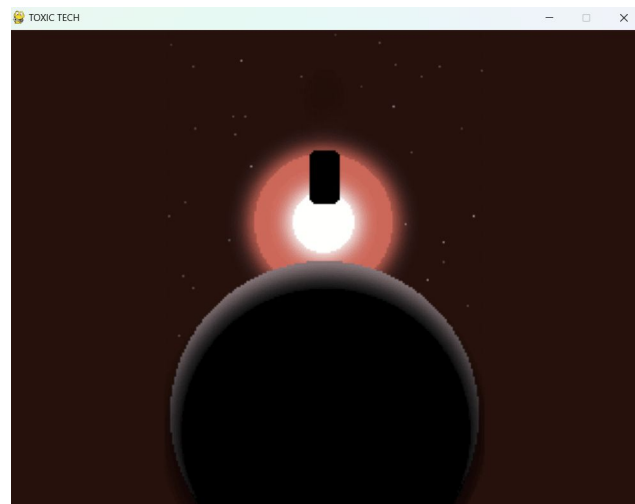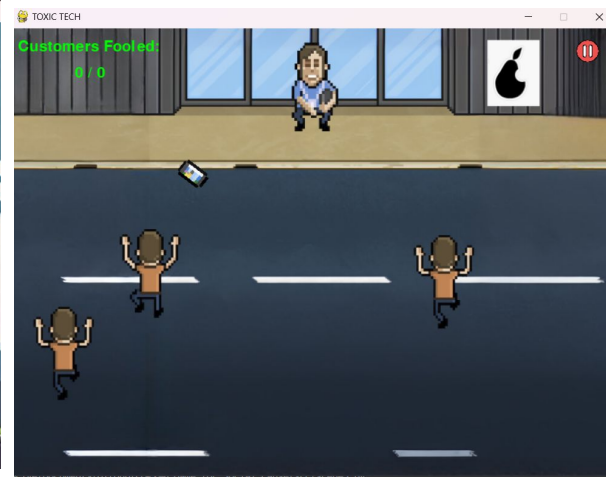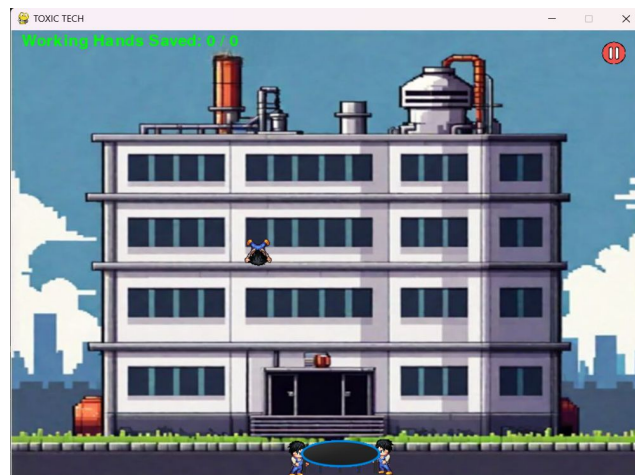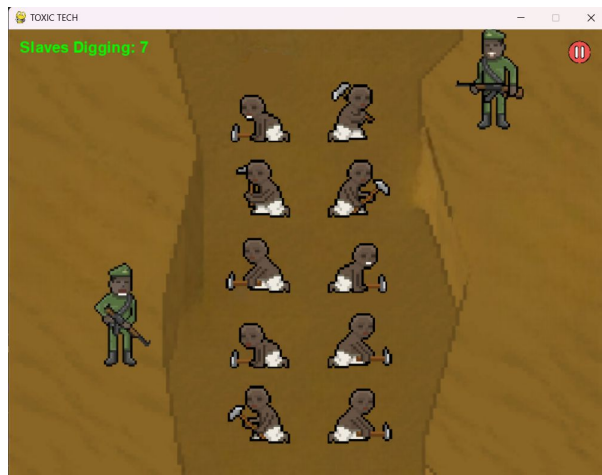
Sprite Design

1. **GIMP** : The GNU Image Manipulation Program is a free and open-source raster graphics editor used for image manipulation and image editing, free-form drawing. It cames especially handy when precise measurements and fine editing were required
2. **Piskel**: A free online sprite editor, a simple web-based tool which was useful for visualising animations.
3. **Canva**: Useful for background editing and AI image generation.

Game Development Libraries

1. Compared to C++ SFML, Pygame was especially handy due to built-in options for most assets. This removes much mental load from the programmer especially in game development where despite best efforts, repetitive code still exists.

2. Due to lack of prior experience with 3D graphics and also because they generally require more sophisticated tool like game engines which were not allowed for the purpose of the assignment, pygame offers a perfect platform for the novice to get into game development.

3. Though, SFML may offer better performance and responsiveness in case of more sophisticated game logic, the differences were not discernable in case of our programs.

Audio Processing Software

FFmpeg is a powerful open-source library that provides a comprehensive set of tools for processing multimedia content. It made the following operations convenient and fast as compared to online tools providing the same functionalities:

1. Interconversion of audio formats and conversion of video to audio formats
2. Trimming audio clips
3. Adjusting playback speed and sound

Target Audience

1. A primary highlight of the game is its target audience which we are confident would be broader than any of our competitors. We firmly believe that anyone using a smartphone be aware of the atrocities which were committed during its production and think twice before mindlessly spending money on electronic products.

2. Our game covers major 4 major problems of our times - human Trafficking, increased suicide rates, consumerism and environmental degradation; topics which everyone must be made aware of.

Limitations

1. **Conflicting goals** : Should a game seeking to raise awareness for a social cause focus on extended and challenging gameplay or drill the idea in the player's mind as easily as possible. We sought to apply Occam's razor and decided it to be the latter even the game was weighted to be 50% of a 3-credit course.
2. **Repetitive code**: Since pygame made life significantly easier, we chose to inherit most of our sprite classes directly from pygame's inbuilt sprite class. We could have used a more hierarchical approach to group objects as per their behaviour.
3. **Uncompetitive** - The game is a delicate balance between playability, understandability and effectiveness in terms of the social cause. We did not include multiple levels in terms of difficulty due to the principle stated earlier.
4. **Single Player** - Unfortunately, the game is able to entertain only one person at a time, though watching someone else play it is equally interesting in our opinion.

Metrics

1. **"The game should be derived from the social cause instead of the social cause being derived from the game":** A game seeking to raise awareness for a social cause should focus on embedding the game's central idea in the player's mind. A game having higher impact socially should weigh more than a game designed to capture attention but not deliver any substantial impact.
2. **Broad audience:** A game with more widespread impact, rather than targeting a niche audience deserves more points as generally games with niche messages have messages derived after the production of the game.
3. **Modular and well written code:** In terms of readability and understandability, as well as reusability, in case it needs to debugged or scaled in future.
4. **Simplicity:** Easy yet engaging and meaningful gameplay
5. **Sprite Design :** Sprites tailor made as per the task and not available on the internet.
6. **Coordination of teammates:** A team effort should always get bonus points than a team with a single person carrying the whole assignment by self.