

Quaranteam - Cellular Automaton: Infectious Disease

Heuristic Evaluation of Cognitive Walkthrough

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## Design Description

The app will be similar to Conway's Game of Life. However, instead of simulating life, the app will simulate infectious disease by having more than two states and objects, air, and people can contract the disease. While there are many rules and parameters involved, the main one is that contagious people, surfaces, and areas can infect other people, surfaces, and areas. Players will also be able to set their own rules and parameters, as well as continue current games and review past games' data.

## UI Domain

This will be a Google OAuth enabled web application used in classrooms and school computer labs. It will allow middle school instructors to teach students about cellular automata and the spread of infectious diseases. The students will be using lab computers, school-provided Chromebooks, or iPads to interact with the application. Students and teachers will be able to change input variables, set up different types of surfaces, as well as save, view, and export their results.

## List of Heuristic Usability Principles

1. App must be easy to learn
  - a. Middle school students are generally between the ages of 11 and 13. These students are going through emotional, physical, and cognitive changes while in school and while they shouldn't be babied, these students should be allowed to learn with technology that is beneficial to them.
2. App must be easy to teach
  - a. While it has been a significant amount of time since any of us were in middle school, I imagine that some teachers are just as useless with technology in the current classroom as they were when I was in the classroom. For students to get the most out of their experience with the app, the teachers must be able to communicate how to utilize it clearly.
3. Must provide a mechanism for learning
  - a. Anyone can play around with a web application, but in order for this project to be successful, it must teach students about cellular automata and the spread of infectious diseases.

## Usability Problems

1. No tutorial

- a. I know that the design team has floated around the idea of a tutorial, but after looking at the paper prototype I am sure that the current design needs one. The landing page after login is overwhelming and confusing. While everything is properly labeled there are no clues about what order or even where to start.
2. Labeling Issues.
  - a. I know that multiplayer is something that is not really possible in the scope of this class, but it is still important to give the students the ability to label different people, objects, and areas. Especially if the students start applying different rules to different people and objects.
3. Colors Used.
  - a. I acknowledge that this was a paper prototype but I encourage the team to keep in mind that students and teachers of all types should be able to use this app. If color blindness is an issue then I recommend some sort of acknowledgment that the colors can be changed if needed.

### Critical Usability Concern

My main concern is the student being able to understand exactly what this web application does and how to utilize it effectively. The students will be using this to learn. This application will teach them about cellular automata and infectious disease spread. How does this app do this? If learning *how* to use the app is the lesson then it is fine the way it is, but in the future students will need a pretty detailed tutorial or even a video walkthrough where they can observe the app being used and see the immediate results.

### Critical Usability Concern Story

Twelve-year-old Inigo Montoya has just witnessed his father being killed by a man with six fingers. Because of this, he will not be attending school for a week so he can attend the funeral and attempt to deal with this tragic loss by throwing his entire being into learning to sword fight. However, his mom says that school is important. She tasks Inigo with completing his take-home assignments.

One of the assignments that Inigo receives from his teacher is to use a new web application to model the spread of an infectious disease. He is given the task of setting mask parameters for all 'people', sanitation parameters for all 'objects', and keeping track of the spread per 'area'. After he completes a simulation for a week, Inigo must download the pdf image that the application provides and upload it to his assignment folder for his class.

Unfortunately for Inigo, he missed his teacher's in-class demonstration for how to use the application and he cannot seem to find a tutorial anywhere. He may struggle for quite a bit of time before either figuring out how to use the application which results in him happily returning to school, or he may never figure out how to use the application and thus decide to abandon all education save for fencing and devote his life to revenge on the six fingered man.