

Earth Girl 2: Preparing for the Tsunami **A Strategy Casual Game**

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Abstract

Earth Girl 2: Preparing for the Tsunami is a strategy casual interactive game with real social impact. The game is about learning and making strategic decisions that can directly increase the survival rate of individuals in a coastal communities during earthquake and tsunami scenarios. Earth Girl is the host and guide, and the player is the protagonist. Earth Girl welcomes the player into the seaside communities while providing knowledge, tips and feedback throughout the game. The game includes scenarios with a real-life twist, and the emphasis is on learning preparedness and survival skills. The basic game play scenario includes: proactive learning about tsunami hazards by talking to people at the market, exploring the site and making strategic decisions, learning from watching the results of the simulation. The level of success of players in this game is directly tied to their level of interaction with the virtual community. This short paper accompanies the live demonstration of the game prototype at the conference.

Introduction

Earth Girl 2: Preparing for the Tsunami is our second interactive game featuring the Earth Girl character. The first one was a side-scrolling platform action game where Earth Girl, the central character, helps villagers to escape natural hazards such as tsunamis, volcano eruptions and flooding. The first game was launched online and also regionally, in South East Asia, in the form of a multi-lingual Collector's edition DVD. The success of the first Earth Girl game prompted us to develop a follow-up product that

explores scientific issues with more complex game play, enhanced functionalities and richer artwork. *Earth Girl 2: Preparing for the Tsunami* was inspired by the kids who live in coastal communities throughout Asia, and also by the fact that 70% of the fatalities in Banda Aceh during the 2004 Indian Ocean tsunami were girls and women. The main goal in the game is to save the people who live in a cluster of sea-side communities.

During the course of our game development process we brought together Earth scientists with professional artists, animators and programmers. After some discussion it was established that the basic game play in *Earth Girl 2* would include elements of strategy contained in a casual environment. This combination of gaming styles is unorthodox, as the mechanics and demographics of casual and strategy games are quite different. Strategy games offer the possibility of analytical depth and logical thinking while casual games offer instant gratification plus the ability to play over and over again regardless of skill or performance.

Basic Game Play

The game takes place in four main areas: the Market, the Map, the Toolbox, and two dozen game levels (Fig. 1).



Fig. 1. (Clockwise from top left) The market, the map, the toolbox, and level detail.

The player learns facts and opinions about tsunamis at the market, selects tools from the toolbox, and puts those tools to use in a variety of levels. The game play mechanics in Earth Girl 2 are about strategy and proactive and experiential learning and do not require a high-degree of manual dexterity.

The Map

The map provides up to 30 game levels or scenarios. The map can be scrolled up and down to find a playable level. The levels are loosely organized in two columns. All the levels on the left column are on the coast and the levels on the right column are also within the reach of the natural hazards. The tsunami arrives from screen left and the villagers have to get away towards screen right. The game levels are of different types including fishermen's villages, resort towns, business districts, industrial areas, residential areas, and cargo ports.

The Market and the Characters

The Market is the place where the player gets to hear opinions and facts about tsunamis. The player must use his/her judgment to distinguish between statements based on factual knowledge and those based on subjective opinions. The market is about proactive and informal learning as possible strategies and tools are discussed here. The player can click on all, some or none of the people in the market to get their advice. Some of the villagers are more informed than others. Many provide realistic and objective information, but some are opinionated, misleading or mistaken. Players can collect tools in the market and add them to their temporary Toolbox.

Each full conversation with a villager is three levels deep, and at the end of the conversation the villager in question recommends a related tool that can be used to accomplish a specific task. The characters include individuals from all ages and backgrounds. In addition to the advice and opinions expressed in the market, each character has multiple facial expressions to provide emotional feedback on selected player's decisions (Fig. 2).



Fig. 2. The auntie, the good boy, and the gangster.

The Toolbox

Players are given a budget for acquiring tools to enhance the survivability of a community. The tools in Earth Girl 2 are grouped in three classes: infrastructure tools, technology tools and education tools.

The infrastructure tools are mostly about building or demolishing physical infrastructure that aids people to escape through the specific challenges of the level. The technology tools include a variety of technologies that can be used as early warning

systems or escape aids. The education tools can be used to teach people about best preparedness practices as well as the most efficient escape behaviors during disasters.

The tools feature three different types of behavior: constant, adaptive and incremental. The constant tools always behave the same no matter what. The Fast Road, for example, is a constant tool that creates road segments that always cost the same regardless of minor differences in length, terrain or environment. The variable tools allow the player to choose one of three variations depending on the specific challenge and the level of difficulty of the level. The Bridge tool, for example, is a variable tool that provides three different types of bridges depending on the width of the river in question, the Bridge tool automatically provides the bridge that best fits the river. The incremental tools can be applied multiple times to the same challenge yielding different and compound results. The Awareness tool, for example, simulates the basic effect of education and can be applied up to five times. The most educated community can make the best collective and individual escape decisions (i.e. when and where to run) during the disaster. Tools become available throughout the game in a progressive way. Only some tools are available at first, and others become available as the player progresses through the game. Some tools are typical of early levels, others are unlocked in advanced levels when players reach a high score.

Playing the Levels

Players can explore new levels by scrolling horizontally, looking for weak spots and areas that can potentially be enhanced. Instant feedback is displayed as the tools are applied, including comments regarding their functionality and status. The effects of the infrastructure tools are easy to grasp, for example building a fast escape road. The results of the education tools and some technology tools can only be fully appreciated during the simulation.

The Simulation

An earthquake and crowd simulation starts in each level when the player pushes the 'READY' button. The simulations are driven by the configuration of each level and by strategies laid out by the player. The results of the simulations, i.e. percentage of

individuals saved, influence the challenges and capabilities that the player faces throughout the game.



Fig. 3. The tsunami wave is represented in different colors and scales, depending on the simulation results.

Conclusion

The game is now in the final stages of completion. The limited user-testing finished to date has helped us to fine tune the game to a core audience that ranges from 10 to 30+ year-old users who are not experts in Earth science nor hazard management but familiar with the style and conventions of casual games.

Acknowledgments

We thanks the following colleagues at EOS for their valuable opinions and scientific advice: Judith Hubbard, Aaron Meltzner, Kerry Sieh, Adam Switzer, and Benoit Taisne. We also thank the Nanyang Polytechnic School of Interactive and Digital Media for their partnership and support. The Earth Girl 2 core team includes the author, Nam Phuong, Muhammad Khadafi, and Shengyi Han. This work was made possible by

13th International Public Communication of Science and Technology Conference

5-8 May 2014, Salvador, Brazil

funding from Singapore's National Research Foundation, the Ministry of Education, and the Nanyang Technological University.