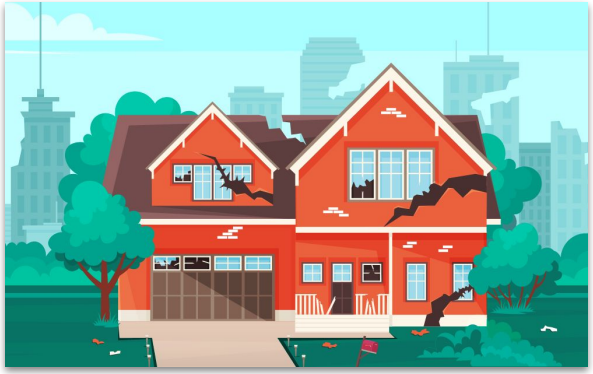
Make-or-Break: A Natural Disaster Simulation Game



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Make or Break: Overview

Make or Break is an application utilizing real-time physics simulations in order to test virtual buildings against the forces of nature.

Make or Break allows users to create, edit, and load real-world recreations of buildings in the 3D environment. They can then **Test** those buildings against natural disasters like earthquakes, floods, or tornadoes.

In **Challenge Mode,** users can build buildings in order to survive certain challenges (real - world and fantastical). **Sandbox Mode** allows users to make buildings with infinite budget and disasters of their own.

Purpose

Make-or-Break provides a platform that empowers users to simulate and test the structural integrity of buildings against various natural disasters.

By offering a real-time physics simulation, the application aims to assist **designers, engineers, and architects** in designing safer and more resilient structures.

The **goal** behind this project seeks to help create safer environments, while also promoting safety and sustainability in construction practices.

Scope of the Work

- Development and release in a mature game market. What can we do to make it unique?
  - *Cities: Skylines, Space Engine, Poly Bridge*
- Games typically use the *default physics system* in a game engine.
  - Use a physics engine that focuses on realism, determinism, and accuracy. (Havok, Jolt)
  - **Write an engine specialized for architecture/engineering.**

Jolt Physics

havok

Product Scope (Player)

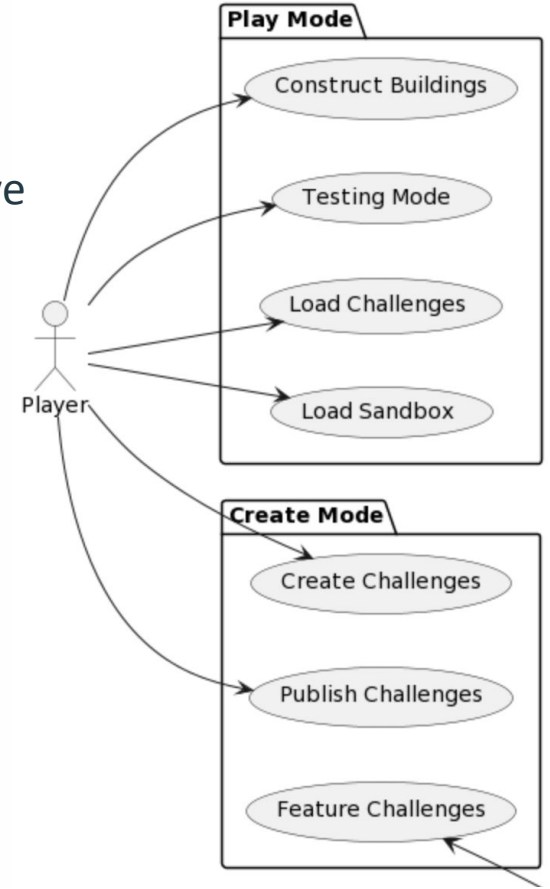
A **Player** who has downloaded the product should have access to 2 suites. **Play Mode** and **Create Mode**.

Play

- Construct Buildings
- Testing Mode
- Load Challenges
- Load Sandbox

Create

- Create Challenges
- Publish Challenges
- Feature Challenges

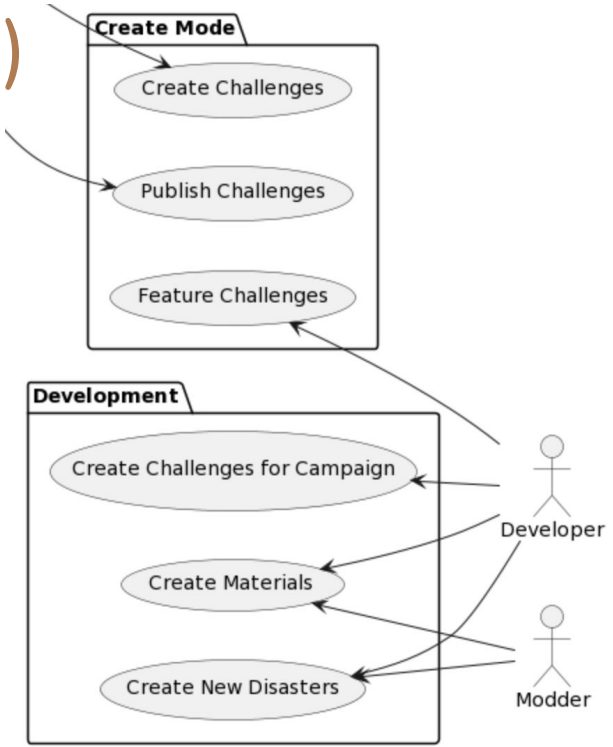


Product Scope (Post-Release)

Post-release, the game should be able to be supported by **Developers** and from the community by **Modders**.

Developers can **Create Challenges for Campaign, Create Materials**, and **Create new Disasters,** as well as **Feature Challenges** that will be seen in Create Mode.

Modders can **Create Materials** and **Create New Disasters**.



Stakeholders

WHO is interested in this service?

Clients: Architect/Engineering firms, Construction Companies, Government Agencies

Customers: Educational Institutions, Insurance Companies, Individual Users.

End-Users: Urban Planners, Gaming Enthusiasts, Students, Property Owners

Release Platforms: Steam. App Stores. Distribution by Companies to Employees

Constraints

- Accessible on PC to low-end hardware (game is physics focused, but not high-fidelity).
  - Windows, Linux, mac-OS
- All levels are forwards-compatible with as production versions release.
- Moderated and secure distribution of Challenge levels to all players.
- Virtual buildings and behaviour of the simulation must try to accurately reflect how they react in real life disasters.
- Security updates to ensure safety in case of a malicious mod published from the modding community

Naming Conventions and Defs

Player: person who buys and plays a release version of the game on their system.

Deterministic physics: physics where the outcome is solely determined by the inputs. Same inputs and variables give you the same results with no randomness.

Updates and Mods: modifications made to the game post-release, (mods usually by players, and updates/patches by developers)

Forwards Compatibility: any version released after specific content was made can load and access that content through conversion or good data practices.

Relevant Facts and Assumptions

- Assumptions
  - The user’s PC specifications meet or exceed the minimum required specifications listed for an optimal experience.
  - Game is a representation of simple physics and objects acting together. It is not a depiction of real structures and does not contain any living entities.
  - Game prioritizes the physics engine rather than visual fidelity of assets in the game.