

# Application Design Document

**Project Name:** TBA

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**Platform:** Electron (Desktop) & Web

**Tech Stack:** Electron + Vite + React + Local JSON File Storage

## 1. Project Overview

WorldBuilder is a modular worldbuilding tool for dungeon masters that supports editable world maps, hierarchical regions, economic simulation, historical timelines, and NPC tracking. It runs as a desktop application with optional web support through import/export of user-owned JSON files.

## 2. Target Users

- Dungeon Masters managing long-term campaigns
- Worldbuilders designing immersive, evolving settings
- Writers building and simulating custom worlds

## 3. Core Features

### Map + Location System

- Upload a custom PNG map
- Add movable, lockable **Markers** representing POIs (cities, towns, ruins, dungeons, etc.)
- Define **Regions** at any scale (province, kingdom, continent)
- Regions can contain markers and other regions
- Click markers to open linked POI entries
- Select or highlight regions on map to view aggregate info

## Economic Simulation

- Each **Region** contains resource data (e.g. grain, ore, luxury goods)
- Events (e.g. war, natural disaster) apply temporal modifiers to regional resources
- Economy system calculates item prices per region based on:
  - Base availability (resource definitions)
  - Regional events on timeline
  - Region relationships (e.g. trade hubs, blockades)

## Timeline System

- Store and view historical **Events**
- Events affect specific regions, POIs, and/or NPCs
- Timeline scrubber allows user to simulate world state at any past point
- Events are taggable and filterable
- Events link to associated regions, NPCs, and POIs

## NPC Manager

- Create/edit NPCs with:
  - Name, portrait, tags
  - Current location (linked to POI or Region)
  - Personal timeline
  - Relationships (directional, e.g. mentor, ally, enemy)
  - Reference to notable inventory items (e.g. legendary weapons)

## Save/Load System

- Desktop:
  - Load/save structured JSON world folders locally
- Web:
  - Export/import world as `.zip` with all JSON and assets
  - Warning if asset sizes are high

## 4. Data Model Overview

### Region Example (**regions.json**)

```
{
  "id": "region_valewood",
  "name": "Valewood Province",
  "type": "Province",
  "parent": "region_the_western_kingdom",
  "children": ["region_north_valewood"],
  "pois": ["poi_eldenford", "poi_granary_watch"],
  "resources": ["grain", "timber"],
  "modifiers": [
    { "year": 1432, "type": "flood", "effect": { "grain": -0.3 } }
  ]
}
```

### POI Example (**locations.json**)

```
{
  "id": "poi_eldenford",
  "name": "Eldenford",
  "type": "Town",
  "description": "Market hub for southern Valewood.",
  "region": "region_valewood",
  "npcs": ["npc_elria"],
  "events": ["event_border_raid"]
}
```

### NPC Example (**npcs.json**)

```
{
  "id": "npc_elria",
  "name": "Elria Thorne",
  "portrait": "elria.png",
  "location": "poi_eldenford",
  "relationships": [
    { "id": "npc_darren", "type": "rival" }
  ],
  "timeline": [
    { "year": 1420, "event": "Founded Elria's Apothecary" },
    { "year": 1432, "event": "Lost shop in Valewood flood" }
  ]
}
```

### Event Example (**timeline.json**)

```
{
  "id": "event_border_raid",
  "name": "Border Raid of 1432",
  "type": "War",
  "year": 1432,
  "regions": ["region_valewood", "region_northlands"],
  "npcs": ["npc_elria", "npc_darren"],
  "effects": {
    "grain": -0.2,
    "livestock": -0.5
  }
}
```

## 5. File Structure

```
worldbuilder/
├─ public/
├─ src/
│   ├─ main.jsx
│   ├─ App.jsx
│   ├─ components/
│   │   ├─ MapViewer/
│   │   ├─ POIPanel/
│   │   ├─ RegionPanel/
│   │   ├─ Timeline/
│   │   ├─ NPCPanel/
│   │   └─ Economy/
│   ├─ data/
│   │   ├─ models/      # region.js, poi.js, npc.js, event.js
│   │   └─ services/    # load/save logic, economic simulation
│   └─ utils/
├─ electron/
│   ├─ main.js
│   └─ fileManager.js
├─ worlds/
│   └─ WorldName/
│       ├─ map.png
│       ├─ regions.json
│       ├─ locations.json
│       ├─ npcs.json
│       ├─ timeline.json
│       ├─ economy.json
│       └─ metadata.json
```

## 6. Development Milestones

### Milestone 1: App Shell + Map

- React + Vite + Electron running
- Load PNG map
- Add/move/lock markers
- Load/save POI metadata

### Milestone 2: Region Editor

- Define/select regions
- Display and link POIs inside regions
- Assign hierarchical parents and children
- Assign resources per region

### Milestone 3: Timeline + Events

- Add/view time-based events
- Tag events with NPCs, regions, POIs
- Timeline scrubber

### Milestone 4: Economic Simulation

- Define base item prices
- Apply event/resource modifiers per region
- View real-time and historical price changes

## **Milestone 5: NPC Manager**

- Add/edit NPCs
- Location linking
- Timeline and relationship system

## **Milestone 6: Save/Load & Web Export**

- Full load/save (Electron)
- Export/import (Web `.zip` format)