StructuresPage [NEW]

▼ Page Specs file

A. Definition Phase

A.1 — Primary Role / Purpose

The **StructuresPage** is the foundational plane of analysis in Zoomout. It surfaces the **deep material formations** that condition historical motion — not merely as institutions, but as **long-reproduced terrains of power**. Its purpose is to show how structures such as caste hierarchies, capitalist regimes, legal codes, kinship systems, and state forms **shape, reproduce, and are challenged by contradictions and struggles** over time.

From a dialectical operations standpoint, the page supports the following:

- **Surfacing material conditions** — Users can browse and analyze the structural bedrock (economic, political, social, cultural) from which contradictions emerge.
- **Mapping structural reproduction and rupture** — Structures are shown as **in motion**, not static — they're being stabilized, reformed, or dismantled across time.
- **Locating strategic terrain** — Users can identify **which structures are being actively contested**, which remain unchallenged, and which underpin multiple contradictions.
- **Understanding causality** — It links the **base (structures)** with the **contradictions** they produce and the **struggles** they face.

The page serves analysts who want to understand:

- What is being reproduced through ideology, violence, policy?
- What contradictions are latent inside a structure?
- Where are sites of structural weakness, rupture, or crisis?
- Which struggles are merely surface-level, and which target systemic formations?

Ultimately, **StructuresPage is the epistemic engine for understanding historical inertia and the conditions of possibility for transformation.**

A.2 — Functional Requirements

The **StructuresPage** must support a robust, layered set of features that enable users to navigate structural terrains with both **typological clarity** and **historical depth**. These features are not just UI necessities but are aligned with Zoomout's core theoretical premise — that structures are **lived, reproduced, and contested**, not merely defined.

✅ Core Functional Requirements:

1. **Type-Based Browsing (4-Column Layout)**
   - Users must be able to **visually differentiate** between structure types (economic, political, social, cultural) using a **four-column grid**, where each column represents a type.
   - Each column is independently scrollable, supporting large datasets.
2. **Filtering Capabilities**
   - Users should be able to filter structures by:
     - **Type**
     - **Region**
     - **Lifespan** (e.g., historic, still active)
     - **Transformation status** (e.g., reproduced, ruptured, reformed)
3. **Structure Cards (`StructureCard`)**
   - Each card must display:
     - Title
     - Type icon + color-coded header
     - Lifespan marker or tag
     - Counts of linked contradictions and struggles
     - Most recent linked event timestamp
4. **Detailed Modal View (`StructureDetailModal`)**
   - On card click, modal must open with:

    - Structure overview and description
    - List of linked contradictions (with intensity phase chips)
    - List of linked struggles (with status + role tags)
    - Mini timeline of historical events tied to the structure
5. **Cross-Linking and Navigation**
    - Users must be able to navigate directly from a structure to:
        - A linked contradiction (→ opens contradiction modal or page)
        - A linked struggle (→ opens struggle modal or page)
        - The TimelinePage (filtered by structure)
6. **Visual Behavior Based on Structure Status**
    - Visually distinguish:
        - Structures with **active struggles or contradictions** (via pulse/glow)
        - Structures with **no links** (via subtle fade or ghost styling)
7. **Virtualized Rendering**
    - Must render cards efficiently with lazy loading to support fast performance even when 100+ structures exist.
8. **Empty States with Meaningful Prompts**
    - Show appropriate prompts and CTAs when:
        - No structures match the filter
        - A structure has no linked contradictions, struggles, or events
9. **Mobile Support**
    - Full responsive layout with vertical stacking by type on smaller screens
    - StructureCard must expand accordion-style, with modals opening full screen
10. **Performance + Prefetching**
    - Modal content loads lazily
    - Filtering is debounced

- Frequently viewed modal data is cached

A.3 — Sheets Used

The **StructuresPage** draws from multiple backend sheets in Zoomout's architecture. Its primary dataset is the **Structures Sheet**, but its true analytical power comes from **relational linkage** — pulling in data from **Contradictions**, **Struggles**, and **Events** to build a living, interconnected view of structural motion.

✅ A. Primary Sheet

- `Structures Sheet`

  This is the **core datasource** for the page. Each row represents a unique structure — a material formation with an internal history and systemic function.

  Key Fields Used:

  - `structure_id`
  - `structure_type` (economic, political, social, cultural)
  - `title`, `abstract`, `description`
  - `origin`, `region`, `lifespan`, `current_form`
  - `linked_contradiction_ids`
  - `linked_struggle_ids`
  - `linked_event_ids`

✅ B. Linked Sheets

1. `Contradictions Sheet`
   - Purpose: To show which contradictions **originate from** or are **reproduced by** a structure.
   - These links are used to:
     - Render **ContradictionListMini** in the modal
     - Show contradiction **intensity phases**

    - Animate or tag contradictions that are currently active or escalating

2. Struggles Sheet
    - Purpose: To show which historical or ongoing struggles are **contesting**, **co-opting**, or otherwise **engaging with** the structure.
    - These entries feed into:
        - **StruggleListMini**
        - Role tags (contesting, reproduced, reformed)
        - Status chips (active, paused, historic)
3. Events Sheet
    - Purpose: To show events that **express structural transformation or continuity** (e.g., liberalization policies, constitutional changes, caste-based violence).
    - Used to generate:
        - **StructureTimelineMini** visual
        - Latest timestamp on the card
        - “Trace Related Events” interaction → opens TimelinePage

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✅ C. Indirect / Future Sheet Linkages

1. Entities Sheet (Indirect)
    - Structures are not directly linked to entities, but through **events**, Zoomout can infer which entities:
        - **Reproduce** a structure (e.g., institutional actors, caste formations)
        - **Contest** it (e.g., movement organizations, reformists)
    - This indirect link can be used in future to build **alignment heatmaps**.
2. Issues Sheet (Future Integration)
    - Structures may be tagged with narrative overlays (e.g., “Land is a livelihood issue” vs. “Land as capital asset”), helping users understand **discursive framings**.

A.4 — Data Relationships

The **StructuresPage** functions as the **base layer** in Zoomout's data ontology. It doesn't just list structures — it maps how **structures generate contradictions**, **are challenged by struggles**, and **are transformed or reinforced through events**. This makes the page an epicenter of **historical linkage**, not a passive catalog.

Below is a breakdown of the **inter-sheet relationships** embedded within this page:

🔷 a. Structures → Contradictions

- **Type**: One-to-many
- **Join**: `linked_contradiction_ids` in `Structures Sheet` maps to `contradiction_id` in `Contradictions Sheet`.

Functionality:

- Each contradiction is rooted in one or more structures.
- A structure may give rise to multiple contradictions across time and space.
- Contradiction list in the modal (`ContradictionListMini`) displays:
  - Contradiction title
  - Intensity phase (Latent → Explosive)
  - Principal tag (if applicable)

Interpretive Value:

- Shows how **deep formations** (e.g., caste hierarchy, wage labor regime) generate conflict.
- Lets user understand if a structure is **structurally generative** of contradictions (high conflict density).

🔷 b. Structures → Struggles

- **Type**: One-to-many
- **Join**: `linked_struggle_ids` in `Structures Sheet` maps to `struggle_id` in `Struggles Sheet`.

Functionality:

- Struggles arise in response to, or in the terrain of, a given structure.
- Modal lists all relevant struggles, along with:
  - Role tag (contesting, co-opted, reproducing)
  - Status tag (active, paused, historic)

Interpretive Value:

- Reveals whether a structure is being **contested**, **stabilized**, or **ignored**.
- Allows users to identify whether political efforts are **targeting deep formations** or not.

🔷 c. Structures → Events

- **Type**: Many-to-many
- **Join**: `linked_event_ids` in `Structures Sheet` maps to `event_id` in `Events Sheet`.

Functionality:

- Events document **key moments of rupture, reproduction, or reform** (e.g., neoliberal reforms, reservation policy expansions).
- Events shown in:
  - `StructureTimelineMini`
  - Metadata field on card (latest event timestamp)

Interpretive Value:

- Makes **historical motion visible**.
- Lets users trace **structural transformation over time**, not just structural description.

🔷 d. Structures → Entities (Derived via Events)

- **Type**: Indirect (Derived Relationship)
- **Link Path**: Structure → Event → Entity

Functionality:

- Entities that appear in events linked to a structure can be interpreted as:

    - Reproducing (e.g., dominant caste bureaucracy)
    - Contesting (e.g., union, reform movement)
- Future versions may visualize this via **stance chips** or **alignment matrices**.

Interpretive Value:

- Shows **who stands where** in relation to structures.
- Enables **entity-structure power mapping**.

B. Design & Layout

B.1 — Layout

The **StructuresPage** uses a **categorical four-column grid layout** that reflects Zoomout's materialist framework. It is intentionally structured to foreground the **typological divisions** (economic, political, social, cultural) that exist between structures, while enabling smooth exploration of historical depth within each type.

✅ Overall Page Layout

- **Header Section (Top)**
    - Contains:
        - **Introductory text** briefly explaining what "structure" means within Zoomout's ontology
        - A **filter panel** with dropdowns and chips to adjust the visible dataset
    - Sticky behavior on scroll — converts into a **collapsed toolbar** for persistent filtering.
- **Main Content Area (Body)**
    - Composed of **four vertically scrollable columns**:
        - **Column 1** — Economic Structures
        - **Column 2** — Political Structures
        - **Column 3** — Social Structures

        - **Column 4** — Cultural Structures
    - Each column hosts a **stack of** `StructureCard` **components**, with cards colored and icon-tagged by type.
    - StructureCards are uniformly sized and virtualized for performance.
- **Detail Panel / Modal**
    - Triggered on `StructureCard` click
    - Opens either:
        - A **right-side drawer** on desktop
        - A **full-screen modal overlay** on mobile
    - Contains tabs or sections for:
        - **Overview**
        - **Linked Contradictions**
        - **Linked Struggles**
        - **Timeline of Events**

✅ Layout Goals

- **Typological Clarity**
    - Layout must clearly separate structure types to reflect Zoomout's theoretical stance that different formations operate via different historical mechanisms.
- **Comparative Analysis**
    - Enables side-by-side scanning of structural fields (e.g., comparing number of active contradictions across economic vs cultural structures).
- **Quick Access to Historical Motion**
    - Each card acts as an entry point into motion: contradiction, struggle, and time — not just definition.

📱 Mobile Adaptation

- Four-column grid collapses into **stacked type sections** (Economic → Political → Social → Cultural)
- Sections are collapsible for smoother vertical scroll
- Filters move into a top drawer or floating action button

B.2 — Component Breakdown

The **StructuresPage** is composed of modular, reusable UI components that each reflect a specific **lens of structural analysis**: typology, contradiction-generation, contestation, and transformation over time. These components allow the user to move fluidly from abstract structure to material motion.

🟦 1. `StructureCard`

- Appears in one of the four structure-type columns (economic, political, social, cultural).
- Displays:
  - Structure title
  - Type icon + color-coded header
  - Region or scope
  - Lifespan marker or tag (e.g. 1832–present)
  - Count of linked contradictions (with intensity marker)
  - Count of linked struggles (with status chip)
  - Last event date (if available)
- Visual behaviors:
  - Header color coded by structure type
  - Hover tooltip previews top contradiction and active struggle
  - Pulses softly if contradictions or struggles are active

🟦 2. `StructureDetailModal`

- Opens when a user clicks on a `StructureCard`
- Drawer-style (desktop) or full-screen (mobile)

- Contains multiple scrollable sections or tabbed views:
  - **Overview** — Abstract, origin, region, evolution
  - **ContradictionListMini** — Tags with contradiction names, intensity chips, clickable
  - **StruggleListMini** — List of linked struggles with role and status chips
  - **StructureTimelineMini** — Visual sequence of events affecting the structure

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🟦 3. `ContradictionListMini`

- Embedded in the modal
- Shows a list of contradictions where the current structure is:
  - An origin point (primary contradiction terrain)
  - A reproducing context (linked via continuity)
- Each contradiction tag includes:
  - Name
  - Intensity phase chip (latent → explosive)
  - Click opens contradiction modal or page

🟦 4. `StruggleListMini`

- Embedded in the modal
- Shows list of struggles engaging the structure
  - Role tag (contesting / reproducing / co-opted)
  - Status chip (active, paused, historic)
- Click opens struggle modal or struggle page

🟦 5. `StructureTimelineMini` (optional)

- Visual mini-timeline of events affecting the structure
- Dot-based horizontal scroll view:

- Each dot = linked event
- Dot color = type of impact (reform, rupture, reproduction)
- Hover = date + event title
- Click = opens full event modal or timeline thread

🟦 6. `FilterBar` / `FilterPanel`

- Appears at top of page
- Allows filtering structures by:
  - Type (multi-select)
  - Region / Country
  - Lifespan (historical / currently active)
  - Transformation status (reproduced / ruptured / reformed)
- Chips animate on selection
- Debounced re-render on filter change

🟦 7. `EmptyStateBlock`

- Replaces modal sections or entire columns when no data is present
- Custom messages for:
  - No contradictions linked
  - No struggles found
  - No event history
  - No matching structures after filter

B.3 — Visual Design Guidelines

The **visual design** of the StructuresPage must embody its epistemic function — to make visible the **weight, durability, and vulnerability** of deep material structures. Visually, the page walks a fine line: it must evoke **historical depth and institutional continuity**, while also surfacing **pressure points** where structures are being **contested, ruptured, or transformed**.

The design system uses consistent cues to orient the user across structural types and relational states.

🎨 A. Color Coding by Structure Type

Used across cards, chips, icons, timeline dots, and modal headers.

Type	Color Name	Hex Code	UI Use Cases
Economic	Steel Blue	`#4682B4`	Card header, icon, filter chip
Political	Firebrick Red	`#B22222`	Card header, tag, modal header
Social	Deep Teal	`#008080`	Card header, role chip
Cultural	Burnt Orange	`#CC5500`	Card header, event dot

Visual Goal: Categorical clarity + easy scanning across types.

🔤 B. Typography

- **Structure Title**: `text-lg font-bold`
- **Abstract**: `text-base text-gray-700`
- **Metadata / Timestamps**: `text-sm text-muted-foreground`
- **Field Names (in modal)**: `text-sm uppercase tracking-wide`
- **Structure IDs or linked schema fields**: Use `monospace` for clarity and database mirroring

Visual Goal: Reflect analytical weight without visual clutter.

🧩 C. Iconography (Consistent Across App)

Each structure type has a dedicated symbolic icon:

Type	Icon
Economic	🏭 Factory
Political	🏛️ Gavel or Parliament Dome
Social	👥 People Chain
Cultural	🎭 Theater Masks or 📚 Book

- Icons appear:

- Top-left of each `StructureCard`
- Next to section titles inside modal
- As filter tags

Visual Goal: Embed symbolic literacy directly into the UI — helps users intuitively connect structure types to real-world formations.

🔁 D. Motion Cues

Motion is used **not decoratively** but to indicate **structural activity** or **lack thereof**:

- **Pulse Animation**:
  - Contradiction or struggle chips marked “active” gently pulse
- **Transition Glow**:
  - Card border or tag glows when a **new link** (contradiction/struggle/event) is formed
- **Fade-In**:
  - Structures with **no contradictions or struggles** fade slightly to indicate undisturbed reproduction

Visual Goal: Reflect dialectical motion — reproduction, rupture, resistance — through subtle animation.

🧱 E. Layout Structure

- **Four equal-width vertical columns**, one for each structure type
- Uniform card dimensions for scannability
- Modals use:
  - Sectioned layout with scroll snapping or tabs
  - Color-matched headers based on structure type

B.4 — Design Elements

Unlike purely decorative UI design, the **StructuresPage** encodes meaning into its visual motifs. Every recurring design element reflects an underlying

political or historical logic, helping users interpret not just the data, but the **systemic function** of each structure.

These motifs are crafted to **amplify dialectical perception** — showing continuity, tension, absence, and reproduction in ways that guide analytical thinking.

🧱 A. Lifespan Bar (Under Card Title)

- **Solid Bar** = continuous reproduction (e.g., caste, capitalism)
- **Dashed Segments** = periods of rupture or transformation (e.g., land reform era)
- **Glow at Right End** = recent or ongoing transformation

Semantic Function:

- Makes structural continuity **visible at a glance**
- Helps user differentiate **inert stability** from **historic volatility**

🌀 B. Structural Pulse & Glow

- **Pulse**: Appears on cards or tags when the structure has an **active contradiction or struggle**
- **Soft Glow**: Appears when a new contradiction or struggle has been recently linked

Semantic Function:

- Shows **where motion is happening** — even if structure type is the same, the level of contestation differs.
- Encourages user to explore high-tension zones first.

🏛️ C. Icon-Language for Type as Function

Each structure type is not just a category but **a mode of social power**:

Icon	Type	Symbolism
🏭	Economic	Exploitation, surplus, infrastructure
🏛️	Political	Sovereignty, law, control
👥	Social	Norms, hierarchy, belonging

🎭/📚	Cultural	Identity, meaning, ideology

Semantic Function:

- Anchors the **superstructure/base dialectic** directly into UI.
- Helps user understand what a structure *does*, not just what it *is*.

🔗 D. Contradiction & Struggle Chips

- Color-coded and icon-enhanced
- Pulse if active
- Hover reveals abstract and intensity (contradiction) or role (struggle)

Semantic Function:

- Shows not just that a structure is *linked* to motion — but **how** and **with what force**.

🕳️ E. Ghost/Fade Motif for Dormancy

- Structures with:
  - No contradictions
  - No struggles
  - No timeline events

    → rendered with **reduced opacity or soft blur**

Semantic Function:

- Absence is never neutral.
- Communicates **invisible reproduction**, **archival erasure**, or **unarticulated contradiction**.

B.5 — Mobile-First Considerations

The **StructuresPage** is deeply visual and typologically rich, but must also remain navigable on smaller screens. Mobile users still need to scan, filter, and interpret material structures, even without the comparative advantages of a widescreen grid. That means rethinking **how motion and typology are presented** when horizontal space collapses.

The mobile-first strategy focuses on **stacking categorical clarity**, **preserving visual affordances**, and **maintaining touch-friendly interactions**.

📱 A. Grid → Stack Conversion

- The four-column layout (economic, political, social, cultural) becomes a **vertically stacked series of sections** on mobile.
- Each section is:
  - Labeled with a **sticky header** (e.g., "ECONOMIC STRUCTURES")
  - **Expandable/collapsible** to reduce scroll fatigue
  - Color-coded consistently with desktop view

Function:

Users can **swipe vertically** through structure types while keeping their typological context intact.

🧩 B. Mobile `StructureCard` Adjustments

- Cards stack vertically and are rendered in **accordion style**:
  - Collapsed view: Title, icon, type, contradiction/struggle counts
  - Expanded view: Abstract, lifespan, event timestamp
- Tap → opens full-screen modal (`StructureDetailModal`)

Function:

Preserves all essential card metadata while ensuring readability on narrow screens.

🖱️ C. Touch-Friendly Filtering

- Filter chips and dropdowns appear in a **bottom drawer or FAB-triggered overlay**
- Filters auto-collapse after selection to conserve space
- Persistent indicator shows active filters

Function:

Maintains full filter functionality with reduced screen real estate and without accidental scroll misfires.

🧭 D. Modal Interface for Detail View

- `StructureDetailModal` opens as a **full-screen overlay** on mobile
- Tabs become **swipeable sections**:
  - Overview → Contradictions → Struggles → Timeline
- Back button and swipe-down gesture for dismissing

Function:

Lets users move between motion layers (e.g., struggle → event) with intuitive gestures.

📈 E. Vertical TimelineMini

- `StructureTimelineMini` becomes a **vertical scroll timeline**
- Dots stacked top-down, with:
  - Event date
  - Event title (tap to expand preview)
- Optional toggle: “Switch to horizontal timeline”

Function:

Preserves the sense of historical sequence and motion — without requiring horizontal scrolling.

🧵 F. Sticky Filters & Re-entry Points

- Sticky filter bar at top of screen after scroll begins
- Persistent navigation chip to “Return to Last Viewed Structure” after modal exit
- Optional CTA: “View all contradictions from this structure”

Function:

Helps users avoid getting lost in modal layers or long scrolls.

C. Behavior & Interaction

C.1 — Component Behaviour

Each component on the **StructuresPage** is designed with **dialectical behavior logic** — meaning it must express not just its state, but also its motion or lack thereof. Components react to **linked data**, **status changes**, and **user exploration**, helping the user perceive structural evolution and contestation in real time.

🧩 StructureCard

- **Hover (Desktop)**:
  - Tooltip shows: Top contradiction + top linked struggle (if any)
  - Slight elevation effect (z-index + shadow) to emphasize interactivity
- **Tap (Mobile)**:
  - Expands accordion-style to show abstract and metadata
  - Tap again opens full-screen `StructureDetailModal`
- **Visual States**:
  - **Pulse**: If the structure has active contradictions or struggles
  - **Glow border**: If a new contradiction/struggle was linked recently
  - **Fade**: If the structure has no contradictions, struggles, or events (i.e., undisturbed reproduction)

🗂️ StructureDetailModal

- **Open**: Triggered by card click or tap
  - Desktop: Right-side drawer modal
  - Mobile: Full-screen overlay
- **Tabbed or Scroll-Segmented**:
  - Tabs: Overview / Contradictions / Struggles / Timeline
  - Tab click or swipe triggers async load of content
- **Live Updating (future)**:

- If a contradiction or struggle is added in another view, modal auto-refreshes content

- **Dismissal**:
  - Desktop: Close icon or ESC key
  - Mobile: Swipe-down or back button

🔗 ContradictionListMini

- **Render**: Shows all contradictions linked to this structure
  - Tags include title, phase chip, optional “Principal” marker
  - Color-coded by intensity (⚪ Latent → 🔴 Explosive)
- **Hover (Desktop)**:
  - Quick summary: “Explosive since May 2024”, or “Latent but active struggle linked”
- **Click**:
  - Opens contradiction modal or contradiction page in new tab
- **Future Behavior**:
  - Tag glow if contradiction is dominant in public narrative (post-narrative overlay update)

✊ StruggleListMini

- **Render**: Each tag includes:
  - Struggle title
  - Role chip: Contesting, Reproducing, Co-opted
  - Status chip: Active, Historic, Paused
- **Hover / Tap**:
  - Shows summary: “Contesting structure via education campaigns”
- **Reactivity**:
  - Role chips animate if reclassified (e.g., from Contesting → Co-opted)

- Sorting logic prioritizes “Contesting + Active” entries at top

- **Click**:
  - Opens struggle modal or full struggle page

📅 StructureTimelineMini

- **Render**:
  - Horizontal scroll of event dots (desktop)
  - Vertical stack (mobile)
- **Hover**:
  - Tooltip shows event date + title
  - Dot size = event impact
  - Dot color = transformation type (Reproduction, Reform, Rupture)
- **Click**:
  - Opens event modal or navigates to TimelinePage with structure filter pre-applied
- **Load Behavior**:
  - Timeline loads last, after contradictions and struggles
  - Skeleton animation during load

🎛️ FilterBar / FilterPanel

- **Click/Tap**:
  - Opens dropdowns or chip selectors
- **Reactivity**:
  - Debounced (250–500ms) before triggering data re-render
  - Filters collapse after use (mobile)
  - “Clear All” button resets state

C.2 — Key UI Behaviour

The **StructuresPage** encodes its political ontology directly into its user experience. Every core UX pattern reinforces Zoomout's dialectical model — that structures are historical terrains of motion, silence, and resistance. Rather than isolating elements, the UI behavior foregrounds **linkage**, **transformation**, and **non-neutral absence**.

Below are the dominant UI behaviors that give the page its systemic feel:

📌 Sticky Filter Bar

- The top filter bar **collapses into a sticky toolbar** once the user scrolls past the intro section.
- This persistent toolbar ensures users can dynamically adjust scope (type, region, lifespan, etc.) without losing orientation.
- On mobile, a floating FAB toggles the filter drawer instead.

Why this matters:

Encourages **iterative exploration** — surfacing new structures through quick filter shifts.

🔄 Live Column Reflow by Filter

- Columns dynamically reflow when filters change:
  - Only relevant structure types remain visible
  - Filtered cards fade out + slide up/down on removal
- Ensures that visual **type organization** persists even as data narrows.

Why this matters:

Maintains **categorical integrity** while supporting zoom-in analysis.

🧭 Scroll-Synced Section Anchors (Mobile)

- On mobile, each structure-type section (Economic, Political, etc.) is **anchored**
- As user scrolls, a floating label indicates the current section ("Viewing: Social Structures")
- Tap-to-jump mini-nav planned for v1.2+

Why this matters:

Helps orient users within stacked views where the grid is collapsed.

⚡ Real-Time Visual Feedback

- Contradictions or struggles linked to a structure animate in (glow/pulse) **immediately** after linkage
- No page reload required
- Modal refreshes linked lists on open, pulling latest connections

Why this matters:

Reinforces that **Zoomout is alive** — structures mutate as the system evolves.

🕳️ Absence as Intentional Design

- Structures with **no struggles or contradictions** fade slightly, appearing more “silent” or “fortress-like”
- This subtle difference cues users to ask:

> “Is this structure stable — or strategically unchallenged?”

Why this matters:

Teaches users to **read silence as reproduction**, not just omission.

🧠 Memory Trail (planned v1.3+)

- “Recently viewed” or “Return to last structure” chip to follow long analytical threads
- Bookmark chip to save structures for later review

Why this matters:

Supports deep research workflows and dialectical trace-building.

C.3 — Interaction Flows

The **interaction flows** of the StructuresPage are designed to support both **guided investigation** and **organic navigation**. Users can enter with a hypothesis (“Which structures are facing rupture in South India?”) or follow the traces of conflict backwards from events or contradictions. Each flow mirrors a core dialectical movement: from base → contradiction → motion → alignment.

Below are four key flows that reflect real user logic:

🔁 A. Flow: Contradiction → Structure → Struggle

1. User visits **ContradictionsPage** to study “Caste vs Capital.”
2. Sees that the contradiction is rooted in structures like:
   - **Brahminical Social Hierarchy**
   - **Post-1991 Labour Regime**
3. Clicks structure tag → opens `StructureDetailModal`.
4. In modal:
   - Sees multiple linked contradictions.
   - Sees active struggle: “Ambedkarite Mobilization (South India)”.
5. Opens struggle → Views its timeline of events.

Outcome:

User understands that this contradiction is **anchored in long-standing formations**, and that struggles are targeting multiple structures in tandem.

🔁 B. Flow: Structure → Contradiction → Event

1. User lands on StructuresPage.
2. Filters for `type: economic`, `region: Tamil Nadu`.
3. Clicks **Informal Labour System (Post-1991)** card.
4. In modal:
   - Sees contradictions: “Capital vs Informal Labour”, “State vs Welfare Entitlements”.
   - Opens “Capital vs Informal Labour” → views event timeline.

5. Jumps into event: “2020 Migrant Worker Crisis”.

Outcome:

User traces **material origin → contradiction → historical flashpoint**, validating their analytical chain.

🔁 C. Flow: Structure → Struggle → Entity Alignment

1. User explores **Patriarchal Kinship System** under `social structures`.
2. Opens structure modal → Sees struggle:
   - “Feminist Movements (Tamil Nadu)”
3. Clicks struggle → Sees entity list:
   - Women’s collectives
   - Conservative religious orgs
   - State bureaucracy
4. Uses alignment map (via PolygraphPage) to see divergence in stance.

Outcome:

User maps **who is aligned with the structure**, who contests it, and **how that alignment shifts** across events.

🔁 D. Flow: Macro Filter Scan

1. User filters: `type: cultural`, `region: South India`, `status: active`.
2. Sees list of 6 cultural structures — most of which:
   - Have no struggles
   - Have only latent contradictions
3. Opens **Brahminical Curricula** structure modal.
4. Adds to watchlist: No open contestation yet, but high reproduction.

Outcome:

User flags structurally stable formations that may be **ripe for future rupture or agitation**.

C.4 — Empty States

In Zoomout, **absence is never neutral**. The StructuresPage treats empty states not as UX glitches but as **politically charged silences**. Whether a structure lacks linked contradictions, struggles, or events, this is not just a gap — it's an **analytical signal**: the formation may be dominant, erased, unarticulated, or unchallenged.

Each empty state has custom copy and design treatment that encourages inquiry and reflection.

❓ A. No Contradictions Linked

Message:

> "This structure has no contradictions recorded yet.
>
> Is it uncontested — or have its contradictions not yet been surfaced?"

UI Treatment:

- `ContradictionListMini` component appears semi-transparent or "ghosted."
- "Add a Contradiction" CTA (admin only)
- "Trace Related Events" button → filters TimelinePage by structure to help user *look for* possible contradictions

Analytical Cue:

- Could indicate deep **ideological embedding** (e.g., nuclear family, caste endogamy)
- Invites users to **dig for submerged tensions**

✊ B. No Linked Struggles

Message:

> "No active or historical struggles have been linked to this structure.
>
> Either this formation remains stable — or resistance has yet to be tracked."

UI Treatment:

- `StruggleListMini` fades slightly
- Icon hint: Fortress or anchored structure
- Optional future toggle: “Show similar structures under contest”

Analytical Cue:

- Raises the question: is this stability **legitimate or coercive**?

📅 C. Structure Has No Event History

Message:

> “No key historical events currently linked to this structure.
>
> Timeline may not yet reflect its evolution.”

UI Treatment:

- `StructureTimelineMini` renders with placeholder: “Awaiting historical motion”
- Suggestion text:

  > “Consider investigating landmark reforms, crises, or acts of repression related to this formation.”

Analytical Cue:

- Suggests either:
  - The structure exists at the level of **ideology or policy**, but hasn't surfaced in direct events
  - The archive hasn't been fully populated — a **curatorial blind spot**

🔍 D. No Structures Match Filter

Message:

> “No structures match your current filters.
>
> Try expanding your scope.”

UI Treatment:

- Reset filters button: “Clear All”
- Optional: “Jump to most active structures”

Analytical Cue:

- Reinforces that **visibility is scoped**, and some terrain is only revealed by widening your analytical lens

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D. Performance & Integration

D.1 — Performance Considerations

> Lazy loading? Client caching? API payload size? Prefetching?

Elaboration:

The **StructuresPage** is potentially one of the most data-heavy views in Zoomout — it deals with long-lived formations that may be linked to **dozens of contradictions**, **hundreds of events**, and **multiple historical struggles**. Optimizing performance is essential to ensure users can explore this terrain **fluidly**, without cognitive or technical friction.

Performance strategies are designed not just for speed, but to preserve the **epistemic clarity of structural motion** — ensuring that heavy data doesn’t obscure the underlying logic of reproduction, rupture, and contestation.

⚙️ A. Virtualized Rendering of Cards

- Structure cards are rendered **only when visible in the viewport**.
- Use **React Window** (or similar lib) to avoid rendering 100+ cards simultaneously.
- Columns independently virtualized for better scroll behavior.

Outcome:

Smooth, lag-free vertical and horizontal navigation — even with large structure sets.

⏳ B. Modal Data Lazy Loading

- `StructureDetailModal` loads its sections **asynchronously**:
  - Contradictions
  - Struggles
  - Timeline
- No prefetching — only loads data **on demand** when user opens modal

Outcome:

Initial page load remains light; data loads **progressively** with user exploration.

🔁 C. Filter Debouncing

- Filters are **debounced** by 250–500ms before triggering rerender or re-query.
- Prevents UI from freezing or over-triggering data loads on rapid input change.

Outcome:

Perceived performance improves; interaction feels responsive and intentional.

📦 D. Batched Data Fetching

- When page first loads:
  - Pulls **basic metadata only** (structure title, type, region, card summary)
  - Deep data (e.g., struggle roles, contradiction phases) only fetched per structure on demand

Outcome:

Reduces API payload size dramatically; no over-fetching.

🧠 E. Client Caching (Modal Focused)

- Cache the last 5–10 opened `StructureDetailModal` payloads in memory.

- When a user reopens a structure they've already viewed, **load from memory**, not backend.
- Option to store cached contradictions and struggles locally by `structure_id`.

Outcome:

Enables fast toggling between structures during comparative analysis.

📊 F. Progressive Timeline Rendering

- `StructureTimelineMini` is rendered **after** contradiction and struggle lists are fully loaded.
- Renders with placeholder animation (skeleton dots) while loading.

Outcome:

Gives user a sense of **forward progress**, avoids UI "stall" while data loads.

D.2 — Integration Points

> External APIs or frontend components reused from other modules.

Elaboration:

The **StructuresPage** is not a standalone module — it serves as the **foundation layer** in Zoomout's relational system. Structures are **upstream of contradictions**, **embedded in struggles**, and **materially expressed through events**. As such, this page **integrates deeply** with multiple sheets, components, and pages across the Zoomout ecosystem.

These integration points ensure the user can move **fluidly across terrain**, tracing causality and motion from structure → contradiction → struggle → event → stance.

🔗 A. ContradictionsPage Integration

- Contradictions have a **"Structural Basis"** field which:
  - Pulls directly from the `Structures Sheet`

- Renders linked structure name(s) inside contradiction modal or summary card

- Clicking a structure link from a contradiction opens:
  - `StructureDetailModal` inline or
  - New tab with filtered `StructuresPage`

Purpose:

Lets user investigate where a contradiction **comes from**, not just how it escalates.

✊ B. StrugglesPage Integration

- Each struggle is linked to the structure(s) it contests or reproduces via `structure_id`
- In the Struggles modal:
  - Structure tag shown under "Context"
  - Click → opens modal on StructuresPage
- Enables pattern tracking: "Which structures face most organized resistance?"

Purpose:

Builds **structural memory of resistance**, not just episodic tracking.

📅 C. TimelinePage Integration

- Events can be **tagged with** `structure_id` — showing whether they:
  - Reproduce
  - Reform
  - Rupture
- Users on TimelinePage can filter by structure:
  - "Show all events affecting caste hierarchy since 2000"
- From StructuresPage:
  - "Trace Related Events" → jumps user to TimelinePage with filter pre-applied

Purpose:

Allows diachronic analysis of **structural transformation over time.**

🧍 D. WikiPage (Entities) Integration

- Entities gain inferred link to structures via:
  - Event participation
  - Alignment in contradiction-linked events
- In entity profiles, show:
  - “Reproduces Structure: X”
  - “Contested: Patriarchal Kinship System”
- Clicking structure tag → opens detail modal

Purpose:

Supports mapping **institutional alignment with formations of power**.

📊 E. ReportingPage Integration

- Structures act as filters for analytical queries like:
  - “Contradictions rooted in political structures (explosive phase)”
  - “Cultural structures with no linked struggles”
  - “Events affecting economic structures in past 12 months”
- Enables snapshot generation of systemic pressure points

Purpose:

Turns structural data into **diagnostic insight** for crisis, inertia, and motion.

E. Iteration & Testing

E.1 — Versioning & Iteration Plans

> What version are we in now? What will the next 1–2 iterations add/change?

Elaboration:

The **StructuresPage** is being built as a foundational surface in Zoomout's dialectical engine — a place where users engage with the **deepest layers of the system**. However, its development is intentionally staged to **layer complexity over time**, allowing the user experience to mature without overwhelming the system or the user.

Each version adds new **diagnostic power**, deeper **structural mapping**, and tighter **cross-sheet integration**, all without compromising clarity or responsiveness.

🧱 v1.0 — Baseline Release

- ✅ Static 4-column layout by structure type
- ✅ StructureCards display title, type, contradictions/struggles count, lifespan
- ✅ `StructureDetailModal` shows:
  - Overview
  - Linked contradictions
  - Linked struggles
- ❌ TimelineMini excluded
- ❌ No dynamic tagging (e.g. reproduction, rupture)

Goal:

Get foundational logic live — material categories, relational cross-links, motion-ready components.

🔍 v1.1 — Structural Intelligence Upgrade

- 🔄 Introduces `StructureTimelineMini`
- 📍 Events rendered as colored dots (reproduction / reform / rupture)
- 📈 Auto-detect contradiction density — add heat-tag or emphasis glow
- 🧭 Add inferred status:
  - `reproduced`, `contested`, `ruptured`

Goal:

Introduce **temporal depth** and **early analytics** for structural motion.

🌐 v1.2 — Dynamic Ecosystem Integration

- 🔁 Enable **filtering by structure** on other pages (e.g. Contradictions, Struggles, Timeline)
- 🔗 Support **bidirectional navigation** from contradiction or struggle → structure and back
- 🧵 Allow cross-modal exploration without reloads (tab chaining)

Goal:

Turn the StructuresPage into a **live map** of systemic embeddedness.

🧠 v1.3 — Reproduction Tracking Engine (Advanced)

- 📊 Auto-classify structural events based on impact:
  - e.g. protest = rupture, law = reform, celebration = reproduction
- 🔥 Introduce visual indicators for:
  - Intensity of reproduction
  - Structural vulnerability (high contradiction but no struggle)
- 💾 Support **annotation or logging** of structural change triggers

Goal:

Allow Zoomout to **actively monitor** how material formations are shifting in real time.

🧬 v2.0+ — Post-Theory Model Integration

- 🧠 Add narrative overlays:
  - "What myths keep this structure intact?"
- 📚 Link to Theory Objects/Instances that **justify**, **legitimize**, or **challenge** the structure
- 🔎 Filter: "Show structures mentioned in ideological texts or manifestos"

Goal:

Merge the **material and ideological** layers — show how structures are not only reproduced **materially**, but also **discursively stabilized**.

▼ **Visualised StructuresPage using ASCII ART**

Here's a clean **ASCII wireframe** visualization of the **StructuresPage**, reflecting its core layout and flow on desktop:

```
+=================================================
|                    STRUCTURESPAGE — HEADER
|-------------------------------------------------------------------
|  [Structure Type Filter]  [Region Filter]  [Lifespan Filter]  [Transformation
+=================================================

| ECONOMIC          | POLITICAL         | SOCIAL           | CULTURAL
|-------------------|-------------------|----------------------|---------
| [StructureCard]   | [StructureCard]   | [StructureCard]      | [StructureCa
| Title: Land Reform  | Title: State Power  | Title: Caste System  | Title: Lang
| Contradictions: 3   | Contradictions: 2   | Contradictions: 6    | Contradictio
| Struggles: 1      | Struggles: 2      | Struggles: 4       | Struggles: 0      |
| Lifespan: 1950–Now  | Lifespan: Ongoing   | Lifespan: Ancient    | Lifespar
|-------------------|-------------------|----------------------|---------
| ...               | ...               | ...                  | ...               |

+=================================================
|                    STRUCTURE DETAIL MODAL (Right)
|-------------------------------------------------------------------
|  > Structure Title: Caste System                                    |
|  > Type: Social | Region: Tamil Nadu | Status: Active
|                                                                     |
|  [Tabs: Overview] [Contradictions] [Struggles] [Timeline]
|                                                                     |
|  Overview:                                                            |
|  - Describes historical origin, evolution, dominant mechanisms
|                                                                     |
|  Linked Contradictions:                                                 |
|  - Caste vs Capital [Explosive]                                       |
|  - Caste vs Reservation [Developing]
|                                                                     |
|  Active Struggles:                                                      |
|  - Ambedkarite Movements [Active]
|  - Anti-Quota Campaigns [Opposition]
|                                                                     |
```

```
|  Timeline (Mini):                                                  |
| [●----●----●---●--------●]  → Reform | Protest | Repression | Rupture
+=================================================
```

Mobile Visualization (Collapsed Stack)

```
+================================+
|     STRUCTURESPAGE (MOBILE) |
+================================+

[ Filter Drawer Icon ]

▼ ECONOMIC STRUCTURES
--------------------
[StructureCard: Land Reform]
[StructureCard: Corporate Policy]

▼ POLITICAL STRUCTURES
----------------------
[StructureCard: State Power]
...

+============================+
|    [Structure Modal Full]  |
|----------------------------|
|  Title: Caste System       |
|  Type: Social              |
|  [Overview] [Contradictions]|
|  [Struggles] [Timeline]    |
|----------------------------|
| Contradictions:            |
| - Caste vs Capital         |
| - Caste vs Reservation     |
+============================+
```

Let me know if you want a **dark-mode version**, printable grid format, or this converted into Figma-compatible reference. Ready for next page?