# **Pre-Coding Essentials (Component: crates/vm\_report/src/render\_html.rs, Version/FormulaID: VM-ENGINE v0) — 65/89**

## **1) Goal & Success**

**Goal:** Render the ReportModel to **HTML** using fixed templates/wording, exact section order, and **one-decimal** presentation; bundle all assets for **offline** use.

**Success:** HTML matches Doc 7 wording/sections; includes the mandatory **approval-denominator** sentence for approval ballots; no external fetches (fonts/styles/tiles).

## **2) Scope**

**In scope:** Template selection, token substitution from ReportModel, section ordering, one-decimal formatting (no re-rounding), **bilingual mirrored** output option, and accessibility/keyboard order constraints.

**Out of scope:** Building the model, computing values, or reading artifacts directly (those happen upstream).

## **3) Inputs → Outputs (with schemas/IDs)**

**Input:** ReportModel (already bound to Result, RunRecord, optional FrontierMap), plus a handle to **bundled assets** (templates/CSS/inline map styles).

**Output:** Deterministic **HTML** string/document following Doc 7 **section order** and fixed wording blocks & footers.

## **4) Entities/Tables (minimal)**

## **5) Variables (only ones used here)**

**Display-only**; no VM-VAR computation here. Ensure **approval-denominator sentence** appears in §3 for approval ballots.

## **6) Functions (signatures only)**

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pub fn render\_html(model: &ReportModel, opts: HtmlRenderOpts) -> String;

pub struct HtmlRenderOpts {

pub bilingual: Option<BilingualPair>, // if Some, produce mirrored full docs

pub embed\_assets: bool, // inline <style>/<script> from bundle

}

fn write\_section\_cover\_snapshot(w: &mut Html, m: &ReportModel);

fn write\_section\_eligibility(w: &mut Html, m: &ReportModel);

fn write\_section\_ballot(w: &mut Html, m: &ReportModel); // adds approval sentence if needed

fn write\_section\_panel(w: &mut Html, m: &ReportModel);

fn write\_section\_outcome(w: &mut Html, m: &ReportModel);

fn write\_section\_frontier(w: &mut Html, m: &ReportModel); // only if FrontierMap exists

fn write\_section\_sensitivity(w: &mut Html, m: &ReportModel);

fn write\_section\_integrity\_footer(w: &mut Html, m: &ReportModel);

fn ensure\_keyboard\_order(doc: &mut Html); // title → snapshot → sections

(Section writers insert **verbatim blocks** per Doc 7B.)

## **7) Algorithm Outline (bullet steps)**

**Initialize** HTML doc, set language/meta; if bilingual, render **mirrored full documents** (not mixed paragraphs).

**Emit sections in order** §1→§10 exactly.

**Ballot (§3):** include the required **approval-rate denominator** sentence for approval ballots.

**Panel (§…):** use Doc 7B **verbatim wording** for quorum/majority/double-majority/symmetry (fill brackets).

**Frontier (§8):** only if FrontierMap exists; show status + diagnostics (mediation/enclave/protected counts; contiguity basis/island rule).

**Sensitivity (§9):** render 2×3 **±1pp/±5pp** table if scenarios exist, else “N/A (not executed)”.

**Integrity & footer (§10 + fixed footer):** identifiers from RunRecord/Result; duplicate fixed footer line.

**Precision:** present **one-decimal** percentages & pp; seats integers; **no double rounding**.

**Offline assets:** inline/bundle all CSS/fonts and any map styles; **no external fetch**.

## **8) State Flow (very short)**

Called by vm\_report::lib after model build; **reads model only**; emits HTML; assets are local/bundled.

## **9) Determinism & Numeric Rules**

Keyboard order fixed; deterministic template paths; no network; numbers appear as strings with one decimal (already formatted in model).

## **10) Edge Cases & Failure Policy**

**Validation failed:** render Cover/Eligibility/Ballot + “Why this run is invalid…”, mark Outcome **Invalid**, **omit Frontier**.

**Gates failed:** render panel with ❌, Outcome “Invalid (gate failed: …)”, **omit Frontier**.

**Frontier mediation/protected impacts:** add ⚠ callout under Outcome; label becomes **Marginal** (already set upstream).

**Bilingual:** two full mirrored docs; **do not mix languages** within paragraphs.

## **11) Test Checklist (must pass)**

Section order and wording blocks match Doc 7; **approval sentence** present for approval ballots.

**One-decimal** everywhere; seats integers; no double rounding.

**Frontier** only when FR exists; diagnostics & counts mirror artifacts.

**Offline**: no external asset requests; HTML renders with bundled fonts/styles.