# **Pre-Coding Essentials (Component: crates/vm\_report/Cargo.toml, Version/FormulaID: VM-ENGINE v0) — 61/89**

## **1) Goal & Success**

Goal: Declare a **reporting crate** that renders reports **offline**, with deterministic builds, and outputs matching Doc 7 specs (one-decimal %; structure fixed).

Success: Builds with workspace lock; no network/runtime assets; provides opt-in features for **JSON** and **HTML/PDF** render paths required by Doc 7.

## **2) Scope**

In scope: Crate metadata; feature flags (e.g., render\_json, render\_html); dependencies only for deterministic, offline rendering; test profile hooks.

Out of scope: Report structure/content (lives in code & templates per Doc 7), pipeline objects.

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

Inputs: Workspace toolchain & lock; vm\_report::structure and render modules consume **Result**, **RunRecord**, optional **FrontierMap**.

Outputs: Build artifacts for report renderers (JSON/HTML), which must show **one-decimal** percentages and include mandated sections/footers.

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

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

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

(manifest has no functions)

## **7) Algorithm Outline (build configuration)**

Define crate with edition + resolver v2 (inherits workspace).

Add **render\_json** feature: depends on serialization stack only (no net). Output must bind to Result/RunRecord/FrontierMap fields.

Add **render\_html** feature: includes template engine/assets **bundled locally**; forbid remote fonts/tiles/scripts.

Ensure **one-decimal** formatting helpers are part of the crate (exposed for both renderers).

Profiles: deterministic release (inherits workspace settings).

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

Used by **vm\_report** library to render §1–§10 sections fixed by Doc 7; consumes **Result/RunRecord/FrontierMap** only.

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

Offline only; no external assets; percent formatting at **one decimal**; integers for seats.

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

If render\_html templates missing external assets, **do not fetch**—fail build; templates must be bundled.

Internationalization: if bilingual is enabled in code, crate must ship mirrored templates; **never mix languages in paragraphs**.

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

JSON/HTML feature builds succeed under --locked; **no network** during render.

Renderers show **one-decimal** percentages; footer IDs sourced from **RunRecord/Result**.