Absolutely—we’ll pause the coding and lock a **clear, split-up presentation plan for M9** that renders *everything* produced by M8.B1–M8.B6, with sensible exports (Excel/CSV/PDF), audience‑specific pages, and a marketing‑ready look using **Streamlit + Matplotlib + Seaborn**.

**Source of truth (recap).** M9 will **only read** the artifacts emitted by M8.Bn (plus M7.5B debug for ties), and it will not recompute metrics. Note that M7.5B already emits IFRS‑helpful fields (EBITDA, Total\_OPEX, Current\_Assets, Current\_Liabilities), which M8.B used and M9 will display.

**M9 presentation plan (what to show, where to show it, and how to export it)**

| **What was computed (M8.Bn)** | **Exact artifacts M9 will read** | **M9 page / sub‑module** | **Visuals & layout (Streamlit / Matplotlib / Seaborn)** | **Exports (per page)** | **Notes / interactions** |
| --- | --- | --- | --- | --- | --- |
| **Base time engine & FX** (M8.B1) | m8b\_base\_timeseries.parquet, m8b1\_smoke.md, m8b1\_debug.json (and m8b\_fx\_curve.parquet if present) | **M9‑01 • Data Explorer & FX** | Left rail filters (Month, Year, Quarter); dual‑currency toggle (NAD↔USD); small cards: *Model Horizon, First Cashflow Month, FX last 6m avg*. FX line chart; stacked area for CFO/CFI/CFF overview. | **CSV/XLSX** of the filtered slice; **PDF** snapshot of the page. | This page is the “staging” view; users can sanity‑check the dataset that powers all other pages. |
| **Promoter scorecard (monthly + yearly)** (M8.B2) | m8b2\_promoter\_scorecard\_monthly.parquet, m8b2\_promoter\_scorecard\_yearly.parquet, m8b2\_smoke.md, m8b2\_debug.json | **M9‑02 • Promoter Dashboard** | KPI tiles with traffic‑light coloring (Current Ratio, Quick Ratio, Working Capital, OER, EBITDA Margin, ROA/ROE, Asset Turnover). Trend charts: monthly lines; bars for yearly averages; “TTM band” overlay. | **XLSX** (Monthly + Yearly sheets); **CSV** (two files); **PDF** (multi‑section with tiles + charts). | Benchmarks/thresholds pulled from M8.B5 (tooltips on tiles). Currency context shown for flows/stocks; ratios unitless. |
| **Investor metrics (selected instrument)** (M8.B3) | m8b\_investor\_metrics\_selected.parquet, m8b3\_smoke.md, m8b3\_debug.json, inputs: m7\_selected\_offer.json, m8b\_gate\_valuations.json | **M9‑03 • Investor Deck (SAFE/CN/Pref/RevShare)** | Gate cards (M24/M36/M42/M48): **MOIC, IRR, DPI/RVPI/TVPI**; Waterfall chart (Invested → Distributions → Residual); Cap/comparison bar at M36; line chart of cumulative investor cash. | **XLSX** (Gates, Monthly Trajectory, Sensitivity if present); **CSV**; **PDF** (investor‑ready one‑pager + appendix). | If some gates are missing, cards show “not configured” with greyed tiles; the page still renders other gates. Pulls instrument text from m7\_selected\_offer.json for header badges. |
| **Lender / bankability pack** (M8.B4) | m8b4\_lender\_metrics\_monthly.parquet, m8b4\_lender\_metrics\_yearly.parquet, m8b4\_smoke.md, m8b4\_debug.json | **M9‑04 • Lender Pack** | DSCR monthly line + heat strip (**min** highlighted); LLCR/PLCR summary table; ICR line; leverage gauges (D/A, D/E, Equity%); collateral coverage table. | **XLSX** (Monthly & Yearly metrics); **CSV**; **PDF** (clean 2–3 page credit memo visuals). | Page lets users set **discount rate** and **maintenance CAPEX view** toggle—purely visual; M8 values remain the baseline. |
| **Benchmarks & comparators** (M8.B5) | m8b\_benchmarks.catalog.json, m8b\_benchmarks.values.parquet, m8b5\_smoke.md, m8b5\_debug.json | **M9‑05 • Benchmark Browser** | Table with metric → range (green/yellow/red), citation; small side‑by‑side “You vs. Benchmark” bars for selected KPIs; hover tooltips with source snippets. | **CSV/XLSX** of benchmark catalog and values; **PDF** summary page. | This also **feeds tooltips**/thresholds across Promoter, Investor, and Lender pages (no recompute). |
| **IFRS presentation + notes** (M8.B6) | m8b\_ifrs\_statements.parquet, m8b\_ifrs\_mapping.json, m8b\_ifrs\_notes.json, m8b6\_smoke.md, m8b6\_debug.json | **M9‑06 • IFRS FS & Notes (NAD & USD)** | Tabs: **P&L, Balance Sheet, Cash Flow, Notes**. Each statement shown as a styled table (sortable, year pickers), with tiny reconciliation callouts (e.g., **CF Closing Cash = BS Cash**). | **XLSX** (one workbook with 4 sheets: PL/BS/CF/Notes); **PDF** (printer‑friendly statements + selected notes). | Currency toggle for statements (NAD/USD). Notes are rendered from m8b\_ifrs\_notes.json with headings and placeholders clearly marked. |
| **M9 manifest (what to show)** | m9\_manifest.json | **M9‑00 • Loader & Navigation** | Uses the manifest to build the sidebar, route to pages, apply theme, and know which artifacts belong to which page. | N/A | The manifest is the only config M9 needs to wire pages in the right order. |

**Exports & packaging (consistent across pages)**

* **Export to Excel (XLSX).** Each page’s **download button** exports its current dataset(s) to one workbook with **one sheet per table** on that page (e.g., “Promoter\_Monthly”, “Promoter\_Yearly”).
* **Export to CSV.** Single or multiple CSVs matching the visible tables.
* **Export to PDF.** We’ll support two paths:
  1. **Browser “Print to PDF”**—a one‑click button that opens a print‑optimized view (best compatibility).
  2. Optional **server‑side PDF** (WeasyPrint/wkhtmltopdf) if the environment supports it, to generate consistent branded PDFs without user interaction.
* **Raw artifacts quick‑links.** Each page includes “Open source file” links to the underlying Parquet/JSON for power users.

**Look & feel (marketing‑ready but sober)**

* **Theme:** Streamlit light/dark switch with a **Terra Nova palette**; consistent font scale; **hero header** per page with subtitle and key callouts.
* **Tiles:** Large KPI tiles (value, YoY/TTM delta, benchmark badge).
* **Charts:**
  + Matplotlib for **PDF‑safe** static plots (lines, bars, area, waterfall).
  + Seaborn for **quick comparative visuals** (e.g., violin/box for monthly spreads when useful).
  + Keep a consistent grid: 2 or 3 columns for tiles; charts below; narrative text at the bottom.
* **Tooltips:** Hover on tiles and headers pulls **definition, formula, and benchmark source** from M8.B5 or the KPI metadata embedded by M8.Bn.
* **Narrative blocks:** Short explainer footers per page (“How to read this chart”, “Limitations / assumptions”).

**Page‑level acceptance checks (so we don’t regress)**

1. **Data load sanity:** Each page verifies its files exist; if not, it shows a **friendly banner** and a “Go to Data Explorer” link.
2. **Currency coherence:** NAD/USD toggles keep **ratios unchanged**, convert only flows/stocks.
3. **IFRS ties:** M9‑06 asserts **CF Closing Cash = BS Cash & equivalents** and displays a green check; mismatch shows a red callout with the delta.
4. **Benchmark consistency:** Tiles display the correct **color band** using m8b\_benchmarks.catalog.json.
5. **Gate presence:** Investor page shows only configured gates and labels missing ones as *“not configured—see m8b\_gate\_valuations.json”*.
6. **Exports:** XLSX contains the same numbers as on screen; PDF reflects the live theme.

**Minimal M9 filesystem layout (no code—just structure)**

src/terra\_nova/modules/m9\_presenter/

├─ pages/

│ ├─ m9\_00\_loader\_nav.py # uses m9\_manifest.json to build navigation

│ ├─ m9\_01\_data\_explorer\_fx.py # reads m8b\_base\_timeseries.parquet

│ ├─ m9\_02\_promoter\_dashboard.py

│ ├─ m9\_03\_investor\_deck.py

│ ├─ m9\_04\_lender\_pack.py

│ └─ m9\_06\_ifrs\_statements.py

├─ utils/

│ ├─ io.py # read parquet/json safely; cache; currency toggle helpers

│ ├─ charts.py # standardized Matplotlib/Seaborn figures

│ ├─ export.py # to\_xlsx(), to\_csv(), print\_view()

│ └─ theming.py # color palette; light/dark; logo strip

└─ assets/

├─ theme.json

└─ logo.svg

* **Routing:** Main runner picks up m9\_manifest.json and assembles the **pages** in that order.
* **One place to read files:** utils/io.py ensures we load each Parquet once and cache it across pages for snappy navigation.
* **Consistent charts:** utils/charts.py standardizes fonts/margins so all pages look like a coherent product.

**What you can tweak—without code**

All levers live in JSON/Parquet already produced by M8.B:

* **Gates, caps, investor terms:** m8b\_gate\_valuations.json (and m7\_selected\_offer.json stays the authority for the selected instrument).
* **Benchmarks & thresholds:** m8b\_benchmarks.catalog.json (change ranges or labels to alter tile colors/site tooltips).
* **IFRS Notes & mapping:** m8b\_ifrs\_notes.json, m8b\_ifrs\_mapping.json (edit placeholders / headings; M9 will render the new text and groupings).
* **Manifest / menu order & visibility:** m9\_manifest.json (add/remove pages, reorder, enable/disable exports at a page level).
* **Theme:** assets/theme.json (palette, fonts), plus a **light/dark** toggle at runtime.

**Sequence to implement (so we stop breaking what works)**

1. **M9‑00 Loader & Data Explorer** (wire manifest; ensure all artifacts load; export buttons work).
2. **M9‑06 IFRS FS & Notes** (statements first so we guarantee accounting ties).
3. **M9‑02 Promoter Dashboard** (tiles + charts + benchmark tooltips).
4. **M9‑03 Investor Deck** (gates, waterfall, MOIC/IRR tables; pulls from selected offer + gate valuations).
5. **M9‑04 Lender Pack** (coverage curves, LLCR/PLCR, collateral).
6. **Benchmark Browser integration** (tooltips across pages + dedicated page).
7. **Polish & theming** (marketing‑ready visuals; PDF print view).

If you want, I’ll now **apply this plan to the current repo** by (a) stabilizing the IFRS detection in M9, (b) wiring the Data Explorer page first, and (c) adding the export utilities and manifest routing—*exactly* as outlined above, while keeping pages independent so a failure in one does not bring down the others.

Absolutely—let’s pause coding and lock a clean, **presentation‑first plan for M9 v1**.  
Below is a concise, actionable blueprint that (a) **uses every artifact** produced by M8.B1–B6, (b) splits the UI into focused sub‑modules, and (c) bakes in **exports for Excel & PDF**, branding with your **Terra Nova Namibia** logo, and marketing‑ready visuals (Streamlit + matplotlib + seaborn).

**1) What M9 will show (everything from M8.Bn), and where it will be shown**

| **M8.B artifact (source file)** | **What it contains** | **M9 sub‑module** | **UI elements (Streamlit)** | **Charts/Tables (matplotlib / seaborn)** | **Exports from this page** |
| --- | --- | --- | --- | --- | --- |
| **m8b\_base\_timeseries.parquet** | Month\_Index, calendar helpers, FX, base NAD/USD twins | **M9.0 – Home & Data Overview** | Global controls (Currency, Granularity M/Y/TTM, Theme, Date range), “Data health” panel | FX curve line chart; calendar heatmap (months vs years); dataset sample table | “Download Base Timeseries” (Excel sheet + CSV) |
| **m8b2\_promoter\_scorecard\_monthly.parquet** & **m8b2\_promoter\_scorecard\_yearly.parquet** | Promoter KPIs (Liquidity, Margins, ROA/ROE, OER, etc.) in NAD/USD + ratios | **M9.1 – Promoter Scorecard** | KPI tiles with traffic‑lights, monthly trend selector, yearly averages panel | Multi‑axis lines (e.g., EBITDA & CFO); bar+line combo for OER vs Gross Margin; waterfall for Net Income bridge | “Promoter Scorecard” workbook (monthly + yearly + data dictionary); page‑PDF |
| **m8b\_investor\_metrics\_selected.parquet** + **m8b\_gate\_valuations.json** + **m7\_selected\_offer.json** | Instrument‑aware returns (MOIC/IRR/DPI/RVPI/TVPI) at gates 24/36/42/48; ownership at cap/discount | **M9.2 – Investor View (Selected Offer)** | Gate selector (24/36/42/48), instrument badge (SAFE/CN/Pref/RevShare), ownership explainer | IRR/MOIC by gate bar chart; cumulative distributions vs capital area chart; conversion economics table | “Investor Pack” workbook; gate‑specific summary PDF “tear‑sheet” |
| **m8b4\_lender\_metrics\_monthly.parquet** & **m8b4\_lender\_metrics\_yearly.parquet** | DSCR (min/avg), ICR, LLCR/PLCR, leverage, LTV, collateral coverage | **M9.3 – Lender / ReFi Pack** | Covenant thresholds controls (editable), variant selector for CFADS definitions | DSCR curve (monthly) + callout of DSCR\_min; LLCR/PLCR bar table; LTV gauge; leverage stack | “Lender Pack” workbook; covenant memo (PDF) |
| **m8b\_benchmarks.catalog.json** & **m8b\_benchmarks.values.parquet** | KPI thresholds, sources, display rules, traffic‑light bands | **M9.4 – Benchmarks & Comparators** | Region/enterprise filters, threshold editor (optional), source tooltips | “Benchmark vs Actual” bullet charts / lollipop plots; heatmap for scorecard | Export edited benchmark set (JSON) + “Benchmark report” PDF |
| **m8b\_ifrs\_statements.parquet** + **m8b\_ifrs\_mapping.json** + **m8b\_ifrs\_notes.json** | IFRS‑presentable PL/BS/CF and **notes scaffold** (NAD & USD) | **M9.5 – IFRS Statements & Notes** | Statement tabs (PL, BS, CF), currency toggle, period slicer; Notes viewer with placeholders | Statement time‑series sparklines beside each line item; cash‑link reconciliation visual | “IFRS Financials” workbook (PL/BS/CF + notes); formatted statements PDF pack |
| **m7\_5b\_profit\_and\_loss.parquet / cash\_flow / balance\_sheet** | Canonical M7.5B outputs (NAD); already used by M8 | **M9.6 – Source Data (Audit)** | Provenance view (columns origins), link checks (CF→BS cash), schema preview | Reconciliation plots (CFO+CFI+CFF vs ΔCash) | “Audit bundle” Excel + JSON manifest used |
| **m9\_manifest.json** (shipped) | What/where to show & defaults | **M9.7 – Settings & Manifest** | View/edit key settings (theme, logo, watermark, toggles) | — | Export updated manifest (JSON) |
| **All smoke/debug JSONs** (m8b\*\_debug.json, smoke.md) | Diagnostics & logs | **M9.8 – Diagnostics** | Last‑run status, warnings list, missing fields | — | Export combined diagnostics (zip) |

**Branding**: Every page uses the Terra Nova logo (top‑left), a **navy × bronze** palette, subtle gradient background, and consistent type scale; watermark option on PDFs.

**2) Global UX & Controls (consistent across pages)**

* **Top bar**: Logo, “Terra Nova Namibia”; **Currency** (NAD/USD), **Granularity** (Monthly / Yearly Avg / TTM), **Theme** (light/dark), **Export** dropdown.
* **Left navigation**: *Home, Promoter, Investor, Lender, Benchmarks, IFRS, Source/Audit, Settings, Diagnostics*.
* **Help panel**: shows KPI formula, units, sources, and benchmark thresholds on hover.
* **Data freshness**: small badge with timestamps of each artifact loaded from /outputs.

**3) Exports (one‑click)**

* **Excel (XLSX)**  
  A single workbook **TerraNova\_M9\_DataPack.xlsx** containing sheets: Overview, Promoter\_Monthly, Promoter\_Yearly, Investor\_Selected, Lender\_Monthly, Lender\_Yearly, IFRS\_PL, IFRS\_BS, IFRS\_CF, IFRS\_Notes, Benchmarks, Base\_Timeseries, Audit\_M7.5B, plus a **Data Dictionary** sheet that spells out every column (pulled from the M8 data contracts you already have).
* **PDF**  
  A polished **TerraNova\_M9\_Report.pdf** with:
  1. Executive Summary (logo, highlights)
  2. Promoter scorecard pages (traffic‑light KPIs + key charts)
  3. Investor tear‑sheets for each gate (24/36/42/48)
  4. Lender coverage pages (DSCR curve, LLCR/PLCR, LTV, covenants)
  5. IFRS statements (PL/BS/CF, 2–3 pages) + notes index
  6. Appendix (benchmarks & methodology).  
     Each page includes date, currency context, and optional watermark.

**4) Data contracts & schema expectations (what M9 expects to read)**

M9 **does not compute**; it **reads** and validates these schemas:

* **Timeseries**: m8b\_base\_timeseries.parquet → must include Month\_Index, Calendar\_Year, Calendar\_Quarter, and FX (e.g., NAD\_per\_USD).
* **Promoter KPIs**: two files with metric\_id, audience='promoter', cadence (M/Y/TTM), currency\_context, value, formula\_text, sources, benchmark\_ref.
* **Investor metrics**: m8b\_investor\_metrics\_selected.parquet with gate rows (24/36/42/48) and columns for moic, irr, dpi, rvpi, tvpi, ownership, gate\_ev, instrument\_id, option\_id.
* **Lender metrics**: monthly + yearly with dscr, icr, llcr, plcr, leverage ratios, ltv, and CFADS variants metadata.
* **Benchmarks**: m8b\_benchmarks.catalog.json (display rules, thresholds, sources) + m8b\_benchmarks.values.parquet (actual thresholds used).
* **IFRS pack**: m8b\_ifrs\_statements.parquet must have columns: Statement ∈ {PL,BS,CF}, **IFRS\_Line\_Item** (or Line\_Item), Month\_Index, Currency, Value. Mapping and notes arrive via m8b\_ifrs\_mapping.json, m8b\_ifrs\_notes.json.
* **Manifest**: m9\_manifest.json controls page order, default currency/granularity/theme, and which KPIs go to each tile.

M9 will **tolerate synonyms** for key columns (e.g., Line\_Item vs IFRS\_Line\_Item) and auto‑diagnose any mismatch on the **Diagnostics** page instead of crashing.

**5) Visual & interaction design (marketing‑ready)**

* **Palette**: Deep navy **#0f1b2b** (primary), bronze **#7c5a3a** (accent), light sandstone background **#f5f2ec** (subtle).
* **Typography**: Clear, large KPI numerals; compact labels; avoid clutter—every chart with a descriptive subtitle and units.
* **Chart styles**:
  + Promoter: time‑series lines + stacked bars for expenses; waterfall for bridges.
  + Investor: gate bar charts (MOIC/IRR), **fan chart** for valuation scenarios, **step plot** for distributions over time.
  + Lender: DSCR curve with **min DSCR callout ribbon**; coverage ratio bars; donut for capital structure.
  + IFRS: **table + sparkline** per major line.
* **Responsiveness**: Two column layout for desktop, single column on small screens.
* **Branding**: Terra Nova logo in header; optional watermark on PDF pages.

**6) Quality gates & behavior if something is missing**

* If any file is absent or a required column is missing:
  + The target page shows a **non‑blocking alert** (what’s missing, where we looked) and offers to open **Diagnostics**.
  + The rest of M9 remains fully usable. **No hard crashes**.
* All “unitless” ratios render **identically** for NAD/USD modes; flows/stocks switch units with currency toggle.
* **Cash‑link check** (CF closing → BS cash) is validated and shown as a green check or a red badge on the IFRS page.

**7) Implementation order (so we ship value fast)**

1. **M9.0 Home & Data Overview** (global controls + health)
2. **M9.5 IFRS Statements & Notes** (core financials)
3. **M9.1 Promoter Scorecard**
4. **M9.2 Investor View** (selected offer, gates)
5. **M9.3 Lender Pack** (covenants view)
6. **M9.4 Benchmarks** (with editable thresholds)
7. **M9.6 Source/Audit** + **M9.7 Settings & Manifest**
8. **Exports (Excel & PDF)** + **M9.8 Diagnostics**

This order ensures the **financial statements** and **promoter/investor** value land first, while diagnostics stay available to keep us out of “silly problems”.

**8) What you will be able to do from the UI (no code, just capability)**

* Switch **Currency** and **Granularity** globally; all pages respect the choice.
* Click any KPI tile to **drill down** into its definition (formula, column lineage, benchmark source).
* Toggle **covenant thresholds** to see red/amber/green effects on the lender page (without altering the underlying data).
* Export **Excel** and **PDF** from any page or all pages at once.
* View and download the **exact manifest** M9 is using for your run.

**9) Branding assets**

* We will place your logo (provided) under src/terra\_nova/modules/m9\_presenter/assets/logo.jpg and reference it in the header across all pages, and in the **cover page** of PDFs.

**Ready to proceed**

If this plan matches your expectations, I’ll move to **implement M9.0 + M9.5** first (Home/health + IFRS Statements & Notes), then roll out the rest in the order above—keeping strictly to **presentation‑only** (no new calculations; all numbers come from M8.Bn).