ExSim Dashboard Suite - User Manual

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Welcome to the ExSim Dashboard Suite! This manual provides step-by-step instructions for using each of the seven integrated decision-support dashboards. These tools are designed to help you optimize every aspect of your ExSim business simulation experience.

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Getting Started

Prerequisites

Before generating dashboards, ensure you have:

- Python 3.8+ installed
- Required libraries: `pip install pandas openpyxl`

Preparing Your Data

1. Export your ExSim reports to a `Reports` folder (or the local `data/` folder in each dashboard directory).
2. Each dashboard will automatically load the required files.

Generating a Dashboard

Navigate to any dashboard folder and run:

```
python generate_<dashboard_name>.py
```

The generated `.xlsx` file will appear in the same folder.

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1. CMO Dashboard (Marketing & Innovation)

Purpose: Optimize your marketing mix, manage product innovation, and ensure your products are allocated by the simulation's market engine.

Tabs Overview

Tab	Purpose
SEGMENT_PULSE	Analyze your position in High/Low customer segments
INNOVATION_LAB	Select product features to invest in
STRATEGY_COCKPIT	Set budgets, prices, and demand forecasts
UPLOAD_READY_MARKETING	Copy-paste values to ExSim
UPLOAD_READY_INNOVATION	Copy-paste innovation decisions

Step-by-Step Instructions

1. **Open `SEGMENT_PULSE`**
    - Review your **Market Share** and **Awareness Gap** for each segment.
    - Check the **Allocation Flag** column:
        - ✅ **OK:** No action needed.
        - ⚠️ **CRITICAL: Boost TV for Allocation:** Your High segment awareness is below 30%. Increase TV budget.
        - ⚠️ **RISK: Losing Volume to Price:** You are priced 5%+ higher than competitors in the Low segment. Consider a price cut.
2. **Go to `INNOVATION_LAB` (if needed)**
    - Set the **Decision** column to `1` for features you want to invest in.
    - The **Total Innovation Cost** updates automatically.
    - Investing in 2-3 features can significantly boost your High segment appeal.
3. **Set Decisions in `STRATEGY_COCKPIT`**
    - **Global Section:**
        - Set your **TV Budget** (drives national awareness for High segment).
        - Set **Brand Focus** (0-30 = awareness focus, 70-100 = attribute focus).
    - **Zonal Section (per zone):**
        - Enter **Target Demand** (your sales forecast). If the "Stockout?" column shows "TRUE DEMAND HIGHER", set this value *above* your last sales.
        - Set **Radio Budget**, **Salespeople**, **Price**, and **Payment Terms**.
    - Review the calculated **Est. Revenue** and **Contribution Margin**.
4. **Copy to ExSim**
    - Go to `UPLOAD_READY_MARKETING` and `UPLOAD_READY_INNOVATION`.
    - Copy the values directly into ExSim's Marketing and Innovation forms.

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2. Production Dashboard (Zone-Based Manufacturing)

Purpose: Plan production output per zone, assign machines and workers, and identify capacity bottlenecks.

Tabs Overview

Tab	Purpose
ZONE_CALCULATORS	Set production targets for each of the 5 zones
RESOURCE_MGR	Manage machine assignments and expansion plans
UPLOAD_READY_PRODUCTION	Copy-paste values to ExSim

Step-by-Step Instructions

1. **Open `ZONE_CALCULATORS`**
    - Each zone (Center, West, North, East, South) has its own block.
    - For each zone:
        - Enter **Target Production** for FN1-FN8.
        - Set **Overtime?** to `Y` or `N`.
    - Review the calculated **Real Output**. If it's lower than your target, you have a capacity constraint.
    - Check for **"SHIPMENT NEEDED!"** alerts. This means local materials are insufficient—you need to order materials to be delivered to that zone.
2. **Go to `RESOURCE_MGR`**
    - **Section A (Assignments):** Assign machines and workers to specific sections within each zone.
    - **Section B (Expansion):** Review the **Capacity Gap** and **Recommendation** (e.g., "Buy 3 M1 machines for West").
    - **Section C (Modules):** If a zone shows "Buy module in [Zone]", you must purchase a factory module in ExSim before you can add machines there.
3. **Copy to ExSim**
    - Go to `UPLOAD_READY_PRODUCTION` and copy the values into ExSim's Production form.

> [!IMPORTANT] **Zone Independence:** Resources in one zone (machines, materials, workers) cannot be used in another zone. If you want to produce in a new zone, you must first buy a module, then machines, then hire/transfer workers, and finally order materials.

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3. Purchasing Dashboard (MRP & Sourcing)

Purpose: Plan material procurement using Material Requirements Planning (MRP), manage lead times, and optimize batch sizes.

Tabs Overview

Tab	Purpose
SUPPLIER_CONFIG	Set up supplier data (costs, lead times, batch sizes)
COST_ANALYSIS	Evaluate your ordering vs. holding cost efficiency
MRP_ENGINE	Calculate material requirements and place orders
CASH_FLOW_PREVIEW	Track procurement spending over time
UPLOAD_READY_PROCUREMENT	Copy-paste values to ExSim

Step-by-Step Instructions

1. **Configure** `SUPPLIER_CONFIG`
    - Enter the data from your Case Guide: **Lead Time**, **Cost/Unit**, **Payment Terms**, and **Batch Size** for each supplier.
2. **Review** `COST_ANALYSIS`
    - Check your **Ordering Cost Ratio**:
        - **> 70%:** You are ordering too frequently. Increase batch sizes.
        - **< 30%:** You are holding too much inventory. Decrease batch sizes or use Just-In-Time.
        - **30-70%:** Balanced. Maintain your current policy.
3. **Plan in** `MRP_ENGINE`
    - **Section A:** Enter **Target Production** (from the Production Dashboard) for FN1-FN8.
    - **Section B:** Review **Projected Inventory**. A **RED** cell means you will have a stockout in that fortnight.
    - **Section C:** Enter order quantities by supplier.

> [!WARNING] **"Time Travel" Rule:** When you order in Fortnight X, goods arrive in Fortnight X + Lead Time.
>
> - Example: If you need stock in FN4 and your supplier has a 2 FN lead time, you must order in **FN2**.

1. **Verify** `CASH_FLOW_PREVIEW`
    - Check that your **Cumulative Spend** is within your budget.
2. **Copy to ExSim**
    - Go to `UPLOAD_READY_PROCUREMENT` and copy the order matrix into ExSim.

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4. Logistics Dashboard (Inventory & Shipments)

Purpose: Balance finished goods inventory across zones by planning inter-zone shipments and managing warehouse capacity.

Tabs Overview

Tab	Purpose
ROUTE_CONFIG	View transport modes and warehouse costs
INVENTORY_TETRIS	Balance inventory across 5 zones
SHIPMENT_BUILDER	Plan inter-zone transfers
UPLOAD_READY_LOGISTICS	Copy-paste values to ExSim

Step-by-Step Instructions

1. **Review** `ROUTE_CONFIG`
    - Understand the three transport modes:
        - **Train:** 2 FN lead time, $5/unit (cheapest, requires planning ahead).
        - **Truck:** 1 FN lead time, $10/unit (balanced).
        - **Plane:** 0 FN lead time, $25/unit (expensive, emergency only).
2. **Open** `INVENTORY_TETRIS`
    - For each zone, enter:
        - **Production** (from Production Dashboard).

        - **Sales** (your expected demand from the CMO Dashboard).
    - Review the **Flag** column:
        - ⚠️ **STOCKOUT!:** Inventory went negative. You need to ship goods *to* this zone.
        - ⚠️ **OVERFLOW!:** Inventory exceeds warehouse capacity. Rent a module or ship goods *out*.
        - ⚠️ **WARNING: >90%:** Inventory is nearing capacity.

3. **Plan Shipments in `SHIPMENT_BUILDER`**
    - Add a row for each transfer:
        - **Fortnight:** When you *order* the shipment.
        - **Origin/Destination:** Zones.
        - **Mode:** Train/Truck/Plane.
        - **Quantity:** Units to ship.
    - The **Arrival FN** is calculated automatically based on the mode.

4. **Update `INVENTORY_TETRIS` Manually**
    - After adding a shipment:
        - In the **Origin** zone, add a **negative** value to the "Outgoing" column for the *order* fortnight.
        - In the **Destination** zone, add a **positive** value to the "Incoming" column for the *arrival* fortnight.
    - Verify that all flags are cleared (show "✓ OK").

5. **Copy to ExSim**
    - Go to `UPLOAD_READY_LOGISTICS` and copy the warehouse and shipment decisions.

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5. CPO Dashboard (Workforce & Compensation)

Purpose: Manage workforce planning, set salaries to avoid strikes, and configure employee benefits.

Tabs Overview

Tab	Purpose
WORKFORCE_PLANNING	Calculate hiring/firing needs by zone
COMPENSATION_STRATEGY	Set salaries and benefits to prevent strikes
LABOR_COST_ANALYSIS	Calculate total labor expense for Finance
UPLOAD_READY_PEOPLE	Copy-paste values to ExSim

Step-by-Step Instructions

1. **Open `WORKFORCE_PLANNING`**
    - Review **Current Staff** per zone.
    - Enter **Required Workers** (from the Production Dashboard).
    - Set a realistic **Turnover Rate** (5% is typical; 10% if morale is low).
    - Review the calculated **Hiring Needed** and **Hiring Cost**.

2. **Set Salaries in `COMPENSATION_STRATEGY`**
    - **First:** Enter the **Inflation Rate** from your Case Guide (e.g., 3%).
    - For each zone, set a **Proposed Salary**.
    - Check the **Strike Risk** column:
        - If it shows **"STRIKE RISK!"**, your proposed salary is below the minimum required. Increase it.

> [!IMPORTANT] **The Formula:** Minimum Safe Salary = Previous Salary × (1 + Inflation Rate). Example: $750 × 1.03 = $772.50 minimum to avoid a strike.

1. **Configure Benefits**
    - **Training Budget:** 2-5% of payroll (reduces defects).
    - **Health Insurance:** 3-5% of payroll (reduces absenteeism).
    - **Profit Sharing:** 5-10% of net profit (boosts morale).

2. **Review `LABOR_COST_ANALYSIS`**
    - Enter your **Estimated Net Profit** to calculate the profit-sharing amount.
    - Share the **Total People Expense** with the CFO.

3. **Copy to ExSim**
    - Go to `UPLOAD_READY_PEOPLE` and copy the values into ExSim's People form.

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6. ESG Dashboard (Sustainability & CO2)

Purpose: Compare green investment options (Solar, Trees, Credits) and determine the most cost-effective way to reduce your CO2 tax burden.

Tabs Overview

Tab	Purpose
IMPACT_CONFIG	Set CO2 tax rates and initiative parameters
STRATEGY_SELECTOR	Compare ROI of different abatement strategies
UPLOAD_READY_ESG	Copy-paste values to ExSim

Step-by-Step Instructions

1. **Configure** `IMPACT_CONFIG`
    - Enter the **CO2 Tax Rate** from your Case Guide.
    - Verify the cost and reduction rates for each initiative (Solar, Trees, Green Electricity, Credits).
2. **Make Decisions in** `STRATEGY_SELECTOR`
    - Enter your **Current Emissions** (tons).
    - Enter your **Energy Consumption** (kWh).
    - Adjust the quantities for each initiative in the yellow cells.
    - Review:
        - **Payback Period:** For CAPEX investments (Solar, Trees). Anything under 3 years is good.
        - **Cost per Ton:** Lower is better.
        - **Net Benefit:** For OpEx options (Credits, Green Electricity). Positive is good.
3. **Decision Rules**
    - **Buy Solar PV:** If the Payback Period is < 3 years and you have the upfront capital.
    - **Buy CO2 Credits:** If you are cash-strapped and need to meet a short-term target quickly.
    - **Plant Trees:** For long-term sustainability and PR benefits. Low ROI but good for image.
    - **Switch to Green Electricity:** If you want predictable annual costs without large upfront investment.
4. **Copy to ExSim**
    - Go to `UPLOAD_READY_ESG` and copy the investment quantities.

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7. CFO Dashboard (Finance & Liquidity)

Purpose: Forecast cash flow, audit profitability, and manage debt to ensure solvency and maintain credit ratings.

Tabs Overview

Tab	Purpose
LIQUIDITY_MONITOR	Track cash flow across fortnights
PROFIT_CONTROL	Project income statement and compare to actuals
BALANCE_SHEET_HEALTH	Monitor debt ratio and credit risk
DEBT_MANAGER	Calculate mortgage payments
UPLOAD_READY_FINANCE	Copy-paste values to ExSim

Step-by-Step Instructions

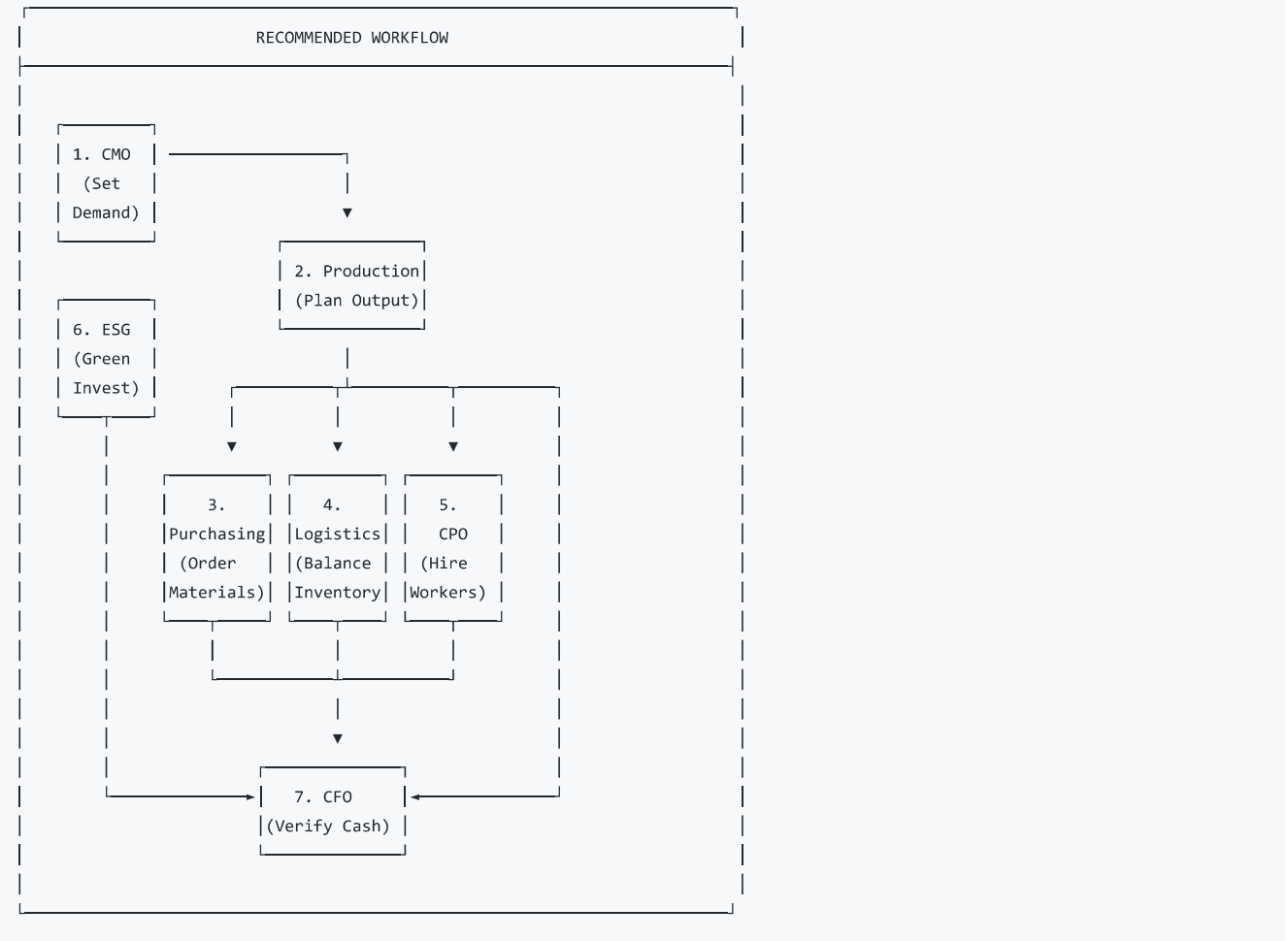
1. **Start with** `PROFIT_CONTROL`
    - Review the **Last Round Actuals** column.
    - Enter your **This Round Projected** values (Revenue, S&A, Depreciation, Interest).
    - Check the **Variance %** column. Large variances (>20%) require justification.
    - Watch the **Profit Realism Flag**. If it says "WARNING: Unrealistic profit jump!", your forecast may be too optimistic.
2. **Check** `BALANCE_SHEET_HEALTH`

- Review your **Current Debt Ratio** (Liabilities / Assets).
- Plan any new debt carefully. If your ratio exceeds 60%, lenders may refuse credit or charge premium rates.
- Look for warning flags:
  - **"CRITICAL: Debt too high":** Credit rating risk.
  - **"CRITICAL: Equity Erosion":** Retained earnings are negative.

3. **Manage** `LIQUIDITY_MONITOR`
   - **Section A (Initialization):** Enter one-time deductions (taxes, dividends, asset purchases).
   - **Section B (Operational):** Enter estimates for Sales Receipts, Procurement Spend, etc. (from other dashboards).
   - **Section C (Financing):** Adjust Credit Line, Investment, and Mortgage values.
   - **Section D (Cash Balance):** Review the **Ending Cash** row.
     - 🔴 **RED (< $0):** Insolvency risk! Adjust financing or reduce spending.
     - 🟢 **GREEN (> $200k):** Inefficient cash holdings. Consider investing.
4. **Configure** `DEBT_MANAGER`
   - Enter any new **Loan Amount**, **Interest Rate**, and **Payment Schedule**.
   - Review the **Total Payments**.
5. **Copy to ExSim**
   - Go to `UPLOAD_READY_FINANCE` and copy the values into ExSim's Finance form.

Recommended Workflow

For the best results, complete the dashboards in the following order:



1. **CMO:** Set your demand forecast and marketing strategy.
2. **Production:** Convert demand into a feasible production plan.
3. **Purchasing:** Order the materials needed for production.
4. **Logistics:** Ship finished goods to balance inventory across zones.
5. **CPO:** Ensure you have enough workers and set fair salaries.
6. **ESG:** Plan any green investments.
7. **CFO:** Aggregate all spending and verify solvency.

Troubleshooting

Problem	Solution
Dashboard shows all zeros	Ensure data files are in the `data/` folder and re-run the script.
"STOCKOUT!" flag won't clear	Add a shipment in `SHIPMENT_BUILDER` and update the "Incoming" column in `INVENTORY_TETRIS`.
"STRIKE RISK!" for all zones	Enter the correct **Inflation Rate** in `COMPENSATION_STRATEGY` and set salaries above the minimum.
Cash goes negative	Increase Credit Line, reduce Procurement Spend, or delay Asset Purchases.
Payback period is infinite	CO2 tax rate may be too low to justify the solar investment. Use Credits instead.

Need more help? Refer to the individual `README.md` file in each dashboard's folder for detailed technical documentation.