

Project Summary: Operational Dashboards

The project aims to develop an operational dashboard for warehouse managers, enhancing real-time visibility and predictive insights. Key objectives include simplifying decision-making, enabling forecasting, and integrating financial metrics. Challenges involve improving data presentation and addressing user experience gaps. Opportunities for differentiation include simulation capabilities and cross-industry applicability. Next steps focus on user stories and competitive analysis.

Long-term Goals

Primary Vision: Create an operational dashboard that gives warehouse managers real-time visibility and predictive insights into their daily operations, moving beyond current manual/tribal knowledge systems.

Key Objectives:

- Build a simplified operational view (separate from complex model-building interfaces) for day-to-day decision-making
- Support shift-ahead forecasting (4-48 hours) for resource allocation and capacity planning
- Enable "common operating picture" across facilities with drill-down capabilities
- Verticalize solutions by industry (warehouse, healthcare, manufacturing) with reusable design patterns
- Integrate financial metrics (cost-benefit analysis) alongside operational metrics
- Eventually connect to real-time data sources (WMS, LMS) to eliminate Excel dependency

Challenges

Technical/Data Constraints:

- Current output visualizations are limited - need more intuitive data presentation for non-technical users
- Excel spreadsheet dependency for scenario inputs (team debating whether to embrace or eliminate this)
- Gap between what can be demoed versus actual capabilities (animation vs. static heat maps)
- Need to balance customization flexibility with out-of-box usability

User Experience Gaps:

- Current dashboards either don't exist or are inadequate (FedEx example: no roster, manual tracking)
- Users need visibility into work progress (e.g., "halfway through 100 picks?") that doesn't exist today
- Difficulty showing 3D models at scale - "people look like ants when zoomed out"
- Need to surface exceptions and recommendations, not just status

Market Positioning:

- Competing with established players (Blue Yonder, Manhattan) who show current state but not predictive insights
- Pressure to deliver capabilities quickly for client demos (FedEx CEO meeting on Nov 17th)
- Multiple personas to serve (ops managers vs. power users vs. systems engineers) with different needs

Opportunities

Differentiation Points:

- Leverage simulation to provide forward-looking predictions (vs. competitors' retrospective-only views)
- Surface optimization recommendations based on scenario analysis
- Provide "what-if" capabilities for same-day disruptions (unexpected truck arrivals, staff shortages)
- Show impact of layout changes before physical implementation

Design Patterns to Borrow:

- **Heat maps** for activity/utilization visualization (inspired by airport management and city simulation games like Cities: Skylines)
- **Threshold-based alerts** with color coding (green/yellow/red zones) for capacity management
- **Dual timeline views:** map-based spatial view + forecast timeline (inspired by Jason's ED module work)
- **Zone-based abstractions** rather than literal 3D layouts for better scanability
- **Drill-down hierarchy:** 30,000 ft overview → zone-level → individual resource detail

Use Case Expansion:

- Cross-industry applicability (manufacturing, healthcare, retail) using same core patterns
- "Moneyball" approach: optimize resource assignments based on individual performance data
- Dynamic slotting models for product placement optimization
- Capacity management for seasonal fluctuations

Journey Map: Intended Operational Experience

Pre-Shift (Primary Use Case)

Persona: June (Warehouse Operations Manager)

1. **Login & Overview** → See facility health at-a-glance
 - High-level metrics: staffing, utilization, throughput, cost
 - Color-coded zones showing capacity status
 - Predicted performance vs. plan for upcoming shift(s)
2. **Identify Risks** → System surfaces bottlenecks/concerns
 - Low utilization in some zones, high in others (92%+ = too busy)
 - Capacity constraints (staging lanes, inventory levels)
 - Timeline view showing when critical thresholds will be hit
3. **Drill Down** → Investigate specific problem areas
 - Zone-level detail (inbound vs. outbound, specific pick zones)
 - Resource allocation by function (unloaders, QA, pickers, put-away)
 - Work content progress (% of picks completed)
4. **Review Recommendations** → System suggests optimizations
 - Rebalance staff from low-utilization to high-utilization zones
 - Add/remove resources based on predicted volume
 - Prioritize work sequences to meet SLAs
5. **Make Decisions** → Adjust staffing/assignments

- Test "what-if" scenarios (add resource, change configuration)
- View predicted impact on metrics before committing
- Execute changes with confidence

Mid-Shift (Exception Handling)

1. **Monitor Progress** → Track actual vs. predicted performance
 - Real-time updates on work completion
 - Alert when deviating from plan
2. **Respond to Disruptions** → Handle unexpected events
 - New truck arrives → Re-run simulation with updated data
 - Staff shortage (snow day) → Optimize remaining resources
 - Late orders → Assess impact on outbound schedule

Post-Shift (Future State)

- Review performance metrics
- Document exceptional situations for continuous improvement

UI Pattern Examples Referenced

From Inspirational Research:

1. **Airport traffic management visualization** (3D heat maps with height variations showing congestion)
2. **Cities: Skylines game UI** (zone-based color overlays, texture reduction for clarity, drill-down views)
3. **Future Flow (existing Pro Model product):**
 - Circular gauge dials for utilization metrics
 - Unit/zone cards with capacity indicators
 - Scenario comparison views
 - Timeline-based forecasting
4. **Jason's ED Module prototype:**
 - Map view with points of interest (census, risk levels, staff allocation)
 - Toggleable data layers (beds available, length of stay, staffing ratios)
 - Prioritized action recommendations with weighted impact scores
 - "Optimization Explorer" showing trade-offs between options

Specific Visual Elements:

- **Staging lane capacity graphs** (line charts showing fill/drain cycles over time)
- **Utilization dials** (percentage-based circular gauges with red/yellow/green thresholds)
- **Zone-based floor plans** (top-down warehouse views with color-coded sections)
- **Work content progress bars** (completed vs. planned)
- **Timeline scrubbers** (navigate between past snapshots and future predictions)
- **Inventory level charts** (peaks and valleys triggering operational decisions)

Interaction Patterns:

- Toggle between views (utilization → staffing → throughput → cost)
 - Drill-down from facility → zone → resource
 - Scenario comparison (baseline vs. alternatives)
 - Threshold configuration for alerts
 - Filtering by time range, zone, or resource type
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Next Steps Identified:

- Deep dive on FedEx storyline as primary design target
- Competitive analysis of Blue Yonder and similar WMS systems
- Catalog use cases across multiple clients to identify universal patterns
- Balance "future vision" design vs. current technical constraints
- Create specific user stories with metrics that matter to ops managers