

Databricks Infrastructure Requirements - Deal Desk Project

To: Anthony Perez, VP Innovation & Growth Programs

From: Ethan Sam, Growth & Innovation Associate

Re: Database Infrastructure for Trading Department Deal Desk Solution

Date: August 2025

Timeline: 6-8 weeks total development



PROJECT STATUS DASHBOARD

Aspect	Details		
Business Sponsor	Van Ngo (RVP Trading, Northeast)		
Technical Lead	Ethan Sam (Growth & Innovation)		
Infrastructure Lead	Anthony Perez (VP Innovation & Growth)		
Development Timeline	6-8 weeks total development		
Current Status	⚠ Blocked - Awaiting Database Setup		
Risk Level	● HIGH - Data loss prevents production launch		

The Challenge: Van's Trading Department needs a Deal Desk application to streamline commercial deal approvals, but we're blocked by data persistence requirements. Current inmemory storage loses all data on server restart.

The Ask: Databricks infrastructure setup to enable persistent data storage for production deployment.

Project Team & Organizational Structure

Team Hierarchy & Collaboration Model

Innovation & Growth Programs Department (Anthony Perez, VP) - **Ethan Sam** (Growth & Innovation Associate) - Technical implementation & database migration - Schema deployment and application integration - Migration testing and performance validation

Trading Department (Cross-departmental collaboration) - **Van Ngo** (RVP Trading, Northeast) - Business requirements definition - User acceptance testing with trading teams - Production rollout and change management

Team Responsibilities Matrix

Team Member	Department	Primary Role	Key Deliverables
Anthony Perez	Innovation & Growth	Strategic Infrastructure Lead	Databricks provisioning, architecture decisions, resource allocation
Ethan Sam	Innovation & Growth	Technical Implementation Lead	Database schema deployment, application migration, testing coordination
Van Ngo	Trading	Business Owner & End-User Champion	Requirements validation, user acceptance testing, trading team rollout

III Current State Analysis

Technical Problem

Technical Architecture Transformation

Current State: High-Risk In-Memory Storage



Target State: Enterprise-Grade Persistent Storage



Business Impact Metrics

Current System Configuration (Source: businessConstants.ts lines 24-29)

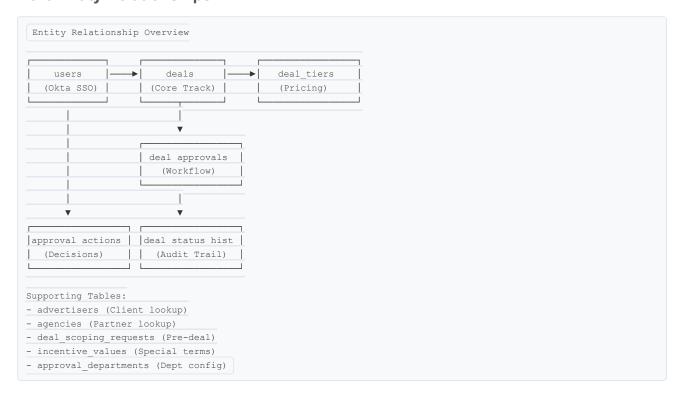
Approval Level	Dollar Threshold	Business Impact
Manager	\$50,000	Department-level deals
Director	\$100,000	Multi-department coordination
VP	\$500,000	Strategic business decisions
SVP	\$1,000,000	Executive-level approvals

Trading Department Impact: - **Current State:** Manual approval processes, no pipeline visibility - **Risk:** Data loss prevents tracking deals through these approval tiers - **Opportunity:** Streamlined workflow for Van's Northeast Trading team

Technical Requirements

Database Schema Architecture

Core Entity Relationships



Detailed Table Specifications

Source: /shared/schema.ts (Drizzle ORM definitions)

1. Core Tables

users - Authentication & Authorization

```
CREATE TABLE users (
  id SERIAL PRIMARY KEY,
  username TEXT NOT NULL UNIQUE,
  password TEXT NOT NULL, -- Okta integration
  email TEXT NOT NULL UNIQUE,
  role TEXT NOT NULL DEFAULT 'seller',
    -- ENUM: seller, department_reviewer, approver, admin
  department TEXT,
    -- ENUM: trading, finance, creative, marketing, product, solutions, legal
  first_name TEXT,
  last name TEXT,
  is active BOOLEAN NOT NULL DEFAULT true,
  created at TIMESTAMP DEFAULT NOW(),
  updated_at TIMESTAMP DEFAULT NOW()
);
```

deals - Core Deal Tracking (30+ fields)

```
CREATE TABLE deals (
id SERIAL PRIMARY KEY,
 deal name TEXT NOT NULL,
 reference number TEXT NOT NULL UNIQUE, -- Format: DEAL-YYYY-XXX
 email TEXT,
 -- Business Classification
 deal_type TEXT NOT NULL, -- ENUM: grow, protect, custom
sales channel TEXT NOT NULL, -- ENUM: holding company, independent_agency, client_direct
deal structure TEXT NOT NULL. -- ENUM: tiored file.
 deal structure TEXT NOT NULL, -- ENUM: tiered, flat commit
 region TEXT,
                                     -- ENUM: northeast, midwest, midatlantic, west, south
 -- Client Information
 advertiser name TEXT,
 agency_name TEXT,
  -- Business Context
 business summary TEXT,
 growth_opportunity_miq TEXT,
 growth_opportunity_client TEXT,
 client asks TEXT,
 growth ambition DOUBLE PRECISION,
 -- Contract Terms
 term start date TEXT, -- ISO 8601 format term end date TEXT, -- ISO 8601 format
 contract_term INTEGER,
                                  -- Calculated months
 -- Financial History
 previous year revenue DOUBLE PRECISION DEFAULT 0,
 previous_year_margin DOUBLE PRECISION DEFAULT 0,
 -- Status Management
status TEXT NOT NULL DEFAULT 'submitted',
 -- ENUM: draft, scoping, converted, submitted, under_review,
```

```
negotiating, approved, contract drafting, client review, signed, lost
 -- Draft & Revision Management
                                -- ENUM: scoping_draft, submission_draft
draft type TEXT,
revision count INTEGER NOT NULL DEFAULT 0,
is revision BOOLEAN NOT NULL DEFAULT false,
parent submission id INTEGER, -- Self-reference for revisions
revision reason TEXT,
last revised at TIMESTAMP,
can edit BOOLEAN NOT NULL DEFAULT true,
draft expires at TIMESTAMP,
 -- Workflow Intelligence
last status change TIMESTAMP DEFAULT NOW(),
priority TEXT NOT NULL DEFAULT 'medium', -- ENUM: critical, high, medium, low
flow intelligence TEXT, -- ENUM: on_track, needs_attention
 -- System Fields
created at TIMESTAMP DEFAULT NOW(),
updated_at TIMESTAMP DEFAULT NOW()
```

deal_tiers - Tiered Pricing Structures

```
CREATE TABLE deal tiers (
id SERIAL PRIMARY KEY,

deal_id INTEGER NOT NULL, -- FK to deals.id

tier_number INTEGER NOT NULL, -- 1, 2, 3, 4, 5 (max tiers: 5)

annual revenue DOUBLE PRECISION NOT NULL,

annual gross_margin DOUBLE PRECISION NOT NULL, -- Decimal: 0.355 = 35.5%

-- Incentive Structure

category name TEXT NOT NULL, -- Display: "Financial", "Resources"

sub category name TEXT NOT NULL, -- Display: "Discounts", "Bonuses"

incentive_option TEXT NOT NULL, -- "Volume Discount", "Growth Bonus"

incentive_value DOUBLE PRECISION NOT NULL, -- USD amount

incentive_notes TEXT,

created_at TIMESTAMP DEFAULT NOW(),

updated_at TIMESTAMP DEFAULT NOW()
);
```

2. Approval Workflow Tables

deal_approvals - Multi-Stage Approval System

```
CREATE TABLE deal approvals (
 id SERIAL PRIMARY KEY,
 deal id INTEGER NOT NULL,
                                                  -- FK to deals.id
 -- Approval Configuration
 approval stage INTEGER NOT NULL, -- 1: Dept Review, 2: Business Approval
 department TEXT NOT NULL, -- ENUM: trading, finance, creative, etc.
required_role TEXT NOT NULL, -- Role needed for approval
 -- Status & Assignment
 status TEXT DEFAULT 'pending', -- ENUM: pending, revision requested, approved priority TEXT DEFAULT 'normal', -- ENUM: normal, high, urgent
 assigned to INTEGER,
                                                 -- FK to users.id
 due date TIMESTAMP NOT NULL,
  -- Review Details
 comments TEXT,
 revision_reason TEXT,
                                                  -- When status = revision_requested
```

```
reviewer notes TEXT,
completed_at TIMESTAMP,
created_at TIMESTAMP DEFAULT NOW()
);
```

approval_actions - Individual Approval Decisions

```
CREATE TABLE approval_actions (
id SERIAL PRIMARY KEY,
approval_id INTEGER NOT NULL, -- FK to deal_approvals.id

action_type TEXT NOT NULL, -- ENUM: approve, reject, request_revision,
-- comment, initiate, assign
performed by INTEGER NOT NULL, -- FK to users.id

comments TEXT,
created_at TIMESTAMP DEFAULT NOW()
);
```

deal_status_history - Complete Audit Trail

```
CREATE TABLE deal_status_history (
id SERIAL PRIMARY KEY,
deal id INTEGER NOT NULL, -- FK to deals.id
status TEXT NOT NULL, -- Current status
previous_status TEXT, -- Previous status
performed_by INTEGER, -- FK to users.id
comments TEXT,
changed_at TIMESTAMP DEFAULT NOW()
);
```

3. Supporting Tables

advertisers - Client Company Data

```
CREATE TABLE advertisers (
   id SERIAL PRIMARY KEY,
   name TEXT NOT NULL UNIQUE,
   previous year revenue DOUBLE PRECISION DEFAULT 0,
   previous year margin DOUBLE PRECISION DEFAULT 0, -- Decimal format
   previous_year_profit DOUBLE PRECISION DEFAULT 0,
   previous_year_incentive_cost DOUBLE PRECISION DEFAULT 0,
   previous year_client_value DOUBLE PRECISION DEFAULT 0,
   region TEXT,
   created_at TIMESTAMP DEFAULT NOW(),
   updated_at TIMESTAMP DEFAULT NOW()
);
```

agencies - Partner Data

```
CREATE TABLE agencies (
  id SERIAL PRIMARY KEY,
  name TEXT NOT NULL UNIQUE,
  type TEXT NOT NULL DEFAULT 'independent', -- ENUM: holding_company, independent
  previous_year_revenue DOUBLE PRECISION DEFAULT 0,
  previous year margin DOUBLE PRECISION DEFAULT 0,
  previous year profit DOUBLE PRECISION DEFAULT 0,
  previous year incentive cost DOUBLE PRECISION DEFAULT 0,
  previous_year_client_value DOUBLE PRECISION DEFAULT 0,
  region TEXT,
```

```
created at TIMESTAMP DEFAULT NOW(),
updated_at TIMESTAMP DEFAULT NOW()
);
```

Foreign Key Relationships & Constraints

```
-- Primary Relationships
ALTER TABLE deals ADD CONSTRAINT fk deals parent
 FOREIGN KEY (parent_submission_id) REFERENCES deals(id);
ALTER TABLE deal tiers ADD CONSTRAINT fk tiers deal
  FOREIGN KEY (deal id) REFERENCES deals(id) ON DELETE CASCADE;
\textbf{ALTER TABLE} \ \text{deal approvals} \ \textbf{ADD CONSTRAINT} \ \text{fk approvals deal}
  FOREIGN KEY (deal id) REFERENCES deals(id) ON DELETE CASCADE;
ALTER TABLE deal_approvals ADD CONSTRAINT fk_approvals_assignee
 FOREIGN KEY (assigned_to) REFERENCES users(id);
ALTER TABLE approval_actions ADD CONSTRAINT fk_actions_approval
 FOREIGN KEY (approval_id) REFERENCES deal_approvals(id) ON DELETE CASCADE;
ALTER TABLE approval actions ADD CONSTRAINT fk actions_user
 FOREIGN KEY (performed_by) REFERENCES users(id);
ALTER TABLE deal status history ADD CONSTRAINT fk history deal
  FOREIGN KEY (deal_id) REFERENCES deals(id) ON DELETE CASCADE;
ALTER TABLE deal status history ADD CONSTRAINT fk history user
  FOREIGN KEY (performed by) REFERENCES users(id);
```

Business Rules & Validation

From /shared/schema.ts validation rules:

Growth Ambition: Minimum \$1M (z.number().min(1000000))

• Tier Numbers: 1-5 only (max 5 tiers per deal)

• **Gross Margin:** 0-1 decimal range (35% = 0.35)

Deal Names: 1-500 characters

· Email Validation: Standard email format

Date Validation: ISO 8601 format required

· Status Transitions: Enforced by workflow rules

Expected Data Volumes & Performance

Table	Monthly Volume	Annual Growth	Index Priority	Storage Est.
deals	500-1000	12K-15K/year	HIGH	50-100MB/ year
deal_approvals	2000-5000	30K-60K/year	HIGH	20-40MB/year

Table	Monthly Volume	Annual Growth	Index Priority	Storage Est.
deal_status_history	5000-10000	60K-120K/ year	MEDIUM	15-30MB/year
approval_actions	3000-8000	40K-100K/ year	MEDIUM	10-25MB/year
deal_tiers	1000-3000	15K-40K/year	HIGH	20-50MB/year
users	200-500	Steady state	LOW	1-5MB total
advertisers	100-200	500-1000/ year	LOW	2-10MB/year
agencies	50-100	200-500/year	LOW	1-5MB/year

Required Indexes for Performance

High Priority Indexes (Week 1):

```
-- Deal queries (most frequent)

CREATE INDEX idx deals status ON deals(status);

CREATE INDEX idx deals created at ON deals(created at);

CREATE INDEX idx_deals_reference ON deals(reference_number);

-- Approval workflow queries

CREATE INDEX idx approvals deal id ON deal approvals(deal id);

CREATE INDEX idx_approvals_assigned_to ON deal_approvals(assigned_to, status);

CREATE INDEX idx_approvals_department ON deal_approvals(department, status);

-- Audit trail queries

CREATE INDEX idx_history_deal_id ON deal_status_history(deal_id, changed_at);
```

Medium Priority Indexes (Week 3-4):

```
-- User and lookup queries

CREATE INDEX idx users email ON users(email);

CREATE INDEX idx_users_role_dept ON users(role, department);

CREATE INDEX idx_tiers_deal_id ON deal_tiers(deal_id, tier_number);

CREATE INDEX idx_actions_approval ON approval_actions(approval_id, created_at);
```

Technical Implementation Requirements

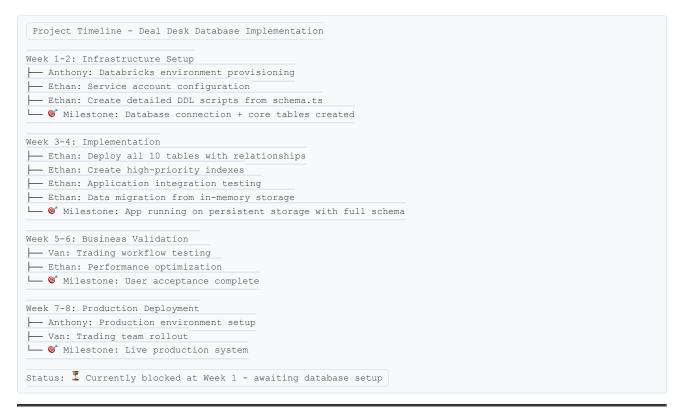
From system configuration (businessConstants.ts): - Default Margin: 35% stored as 0.35 (line 13) - Max Tiers per Deal: 5 (line 8) - enforced by validation - Contract Term Default: 12 months (line 14) - Approval Thresholds: \$50K/\$100K/\$500K/\$1M (lines 24-29) - Database Type: SQL Server compatible (T-SQL syntax) - Authentication: Azure AD token-based - Performance Target: <500ms query response - Connection Pooling: 10-20 connections recommended - Transaction Isolation: READ_COMMITTED for consistency

Migration Considerations

From In-Memory to Databricks: 1. Data Types: Drizzle ORM → T-SQL mapping required 2. Enum Handling: Convert TypeScript enums to CHECK constraints 3. JSON Fields: incentive_types array field needs JSON support 4. Timestamp Handling: UTC consistency across all timestamp fields 5. Reference Numbers: Auto-generation sequence setup 6. Cascade Deletes: Ensure proper referential integrity

Schema Evolution Strategy: - Version 1.0: Core tables (deals, users, approvals) - Version 1.1: Add indexes and performance optimizations - Version 1.2: Add audit triggers and compliance features - Version 2.0: Add advanced analytics and reporting tables

Development Timeline (6-8 Weeks)



> Infrastructure Decision Points

Anthony - Strategic Architecture Decisions Needed:

Option A: Shared Environment

```
Pros: Faster setup, shared resources

Cons: X Potential conflicts, limited isolation

Cost: $ Lower

Timeline: 1-2 weeks setup
```

Option B: Dedicated Environment

```
Pros: \overline{f V} Full control, performance isolation
Cons: X More setup time, dedicated resources
Cost: $$$ Higher
Timeline: 2-3 weeks setup
```

Option C: Staged Approach

```
Pros: 🔽 Test in shared, production dedicated
Cons: X Two-phase migration
Cost: $$ Moderate
Timeline: 2-4 weeks total
```

Recommendation: Option C (Staged) - Start with shared test environment, migrate to dedicated production.

Success Framework

Success Metrics & KPIs

Category	Metric	Target	Current Status
Data Integrity	Zero data loss events	▼ 100% persistence	➤ Blocked - in-memory only
Performance	Query response time	<500ms average	⚠ TBD - needs testing
Scalability	Concurrent	✓ 200+ supported	X Limited to single session
Reliability	System uptime	▼ 99.9% availability	X Restart = data loss
Compliance	Complete audit trail	Full history tracking	X No persistence
User Adoption	Trading team usage	50+ users within 30 days	☑ Pending database setup

Business Success Metrics

Business Goal	Success Criteria	Measurement
Operational Efficiency	40% reduction in deal approval	Average time from

Business Goal	Success Criteria	Measurement
	cycle time	submission to approval
Pipeline Visibility	Real-time tracking across all approval tiers	Dashboard usage and deal status accuracy
Compliance Readiness	Complete audit trail for regulatory requirements	100% of status changes logged with user attribution
Team Adoption	50+ active users within 30 days of launch	Daily/weekly active user metrics

% Immediate Action Items

This Week (Critical Path - Ethan & Anthony)

Anthony's Decisions Needed: - [] Choose environment approach (A, B, or C above) - [] Approve test database provisioning

- [] Assign technical contact for setup coordination

Ethan's Deliverables: - [] Provide detailed schema DDL scripts - [] Document connection requirements - [] Create migration testing plan

Next Week

Joint Activities: - [] Database environment validation - [] Initial connection testing - [] Schema deployment verification

↑ Technical Specifications Detail

Connection Requirements

```
Database Configuration Needed:

- Server: [TBD - Anthony to provide]

- Database: deal desk test (initial)

- Auth: Azure AD service account

- Permissions: CREATE, SELECT, INSERT, UPDATE, DELETE

- SSL: Required (TLS 1.2+)

- Pooling: Connection pool size: 10-20
```

Service Account Setup

• Account Name: svc-dealdesk-prod

- · Permissions: Read/write to designated schema only
- · Rotation: Standard MiQ security policy compliance
- Monitoring: Query performance and access logging

Coordination & Communication

Immediate Team Sync Needed: - Anthony & Ethan: Technical architecture review (30 min)

- Van & Ethan: Business validation planning (30 min)
- All Three: Weekly status check-ins during 6-8 week timeline

Questions for Discussion: 1. Which environment approach fits Innovation & Growth Programs strategy? 2. Any existing Databricks infrastructure we can leverage? 3. Standard process for promoting test \rightarrow production in our department?

Risk Mitigation

Risk	Impact	Mitigation
Data Loss	HIGH	Immediate database setup
Performance	MEDIUM	Load testing in week 4-5
Integration	MEDIUM	Parallel development streams
Trading Team Adoption	MEDIUM	Van's change management plan

Next Steps: Anthony, please review the environment options above and let's schedule a brief technical planning session. Van's trading team is ready to validate the solution as soon as we have persistent storage.

Internal Contacts: - Ethan Sam (Technical): ethan.sam@miqdigital.com - Van Ngo (Business): van.ngo@miqdigital.com