Opportunity Scoring Engine Implementation (STEP 13)

Implementation Date: November 29, 2025
Status: ✅ Complete
Git Commit: b2f2cad

Overview

The Opportunity Scoring Engine is an internal qualification system that assigns a 0-100 score to each RFP, representing how attractive and winnable the opportunity is. The score is calculated using 8 weighted dimensions, either automatically via AI or manually by users.

Key Components

1. Database Schema Updates

File: `prisma/schema.prisma`

Added 5 new fields to the `RFP` model:

```
// Opportunity Scoring (STEP 13)
opportunityScore               Int?
opportunityScoreBreakdown      Json?
opportunityScoreUpdatedAt      DateTime?
opportunityScoreSource         String?
opportunityScoreOverrideReason String?
```

Migration Applied: `npx prisma generate && npx prisma db push`

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2. Core Scoring Library

File: `lib/opportunity-scoring.ts`

Scoring Dimensions (8 total):

Dimension	Weight	Description
strategicFit	0.15	How well this opportunity aligns with our overall strategy
solutionFit	0.15	How well the solution fits the requirements
competitiveAdvantage	0.15	How strong our differentiation is
budgetAlignment	0.10	Budget fit vs. our expectations
timelineFeasibility	0.10	Can we realistically meet the timeline?
winProbability	0.20	Estimated likelihood of winning
internalReadiness	0.10	Do we have resources/bandwidth to execute?
riskScore	0.05	Overall risk (inverted: 100 - score)

Key Functions:

- `calculateWeightedOpportunityScore(breakdown)` - Computes final score from dimension scores
- `getOpportunityRating(score)` - Returns rating info (High/Medium/Low) with colors
- `validateBreakdown(breakdown)` - Validates structure before storage

Exports:

```
export interface OpportunityScoreBreakdown {
  strategicFit: DimensionScore;
  solutionFit: DimensionScore;
  competitiveAdvantage: DimensionScore;
  budgetAlignment: DimensionScore;
  timelineFeasibility: DimensionScore;
  winProbability: DimensionScore;
  internalReadiness: DimensionScore;
  riskScore: DimensionScore;
  overallComment?: string;
}
```

---

3. API Endpoint

File: `app/api/rfps/[id]/score/route.ts`

Endpoint: `POST /api/rfps/[id]/score`

Request Body:

```
{
  "mode": "auto" | "manual",
  "breakdown": { /* OpportunityScoreBreakdown */ },
  "overrideReason": "string"
}
```

Modes:

Auto Mode (AI-Powered)

- Uses OpenAI GPT-4o-mini model
- Constructs prompt with RFP context (title, description, company, supplier, budget, priority, tasks)
- Returns structured JSON with scores and rationales
- Fallback to heuristic scoring if OpenAI fails

Manual Mode

- Accepts pre-filled breakdown from user
- Validates structure and calculates weighted score
- Stores override reason for audit trail

Error Handling:
- 400: Invalid mode or missing required fields
- 401: Unauthorized (no session)
- 403: Forbidden (not RFP owner)
- 404: RFP not found
- 500: Server error (OpenAI failure, internal error)

Success Response:

```
{
  "success": true,
  "rfp": { /* updated RFP object */ },
  "score": 85,
  "breakdown": { /* OpportunityScoreBreakdown */ },
  "source": "AUTO" | "MANUAL"
}
```

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4. UI Components

A. Opportunity Score Panel

File: `app/dashboard/rfps/[id]/opportunity-score-panel.tsx`

Props:
- `rfpId: string`
- `score: number | null`
- `breakdown: OpportunityScoreBreakdown | null`
- `source: 'AUTO' | 'MANUAL' | null`

- `updatedAt: Date | null`
- `overrideReason: string | null`

Features:

1. **No Score State:**
   - Shows “No opportunity score has been calculated yet”
   - Displays “Calculate Score with AI” button
2. **Score Exists State:**
   - Large score badge (e.g., “82 / 100”)
   - Color-coded rating:
     - 80-100: Green “High Opportunity”
     - 50-79: Amber “Medium Opportunity”
     - 0-49: Red “Low Opportunity”
     - Metadata: Source (AI/Manual), Last updated
     - Detailed breakdown with 8 dimensions
     - Two action buttons:
     - **Recalculate with AI:** Re-generates score (with confirmation for manual overrides)
     - **Manual Override:** Opens modal for custom score entry
3. **Manual Override Modal:**
   - Numeric input (0-100)
   - Textarea for override reason (required)
   - Validation before submission

Placement: After company/supplier info, before AI Executive Summary

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B. RFP List Page Integration

File: `app/dashboard/rfps/page.tsx`

Changes:

1. Added “Score” column header to table
2. For each RFP row, displays:
   - Color-coded badge if score exists
   - “–” if no score
3. Badge styling:
   - Green (bg-green-100 text-green-700): 80-100
   - Amber (bg-amber-100 text-amber-700): 50-79
   - Red (bg-red-100 text-red-700): <50

Example:

```
<td className="py-4 px-4">
  {opportunityRating ? (
    <span className={`inline-block px-3 py-1 rounded-full text-xs font-semibold ${op-
portunityRating.bgColor} ${opportunityRating.textColor}`}>
      {rfp.opportunityScore}
    </span>
  ) : (
    <span className="text-gray-400">—</span>
  )}
</td>
```

C. Kanban Board Integration

Files:
- `app/dashboard/rfps/board/page.tsx` (data fetching)
- `app/dashboard/rfps/board/kanban-board.tsx` (UI display)

Changes:

1. **Data Fetching:** Added `opportunityScore` to Prisma select query
2. **Card Display:** Added small circular score badge next to title
3. **Badge Features:**
   - 8x8 pixel circle
   - Color-coded (same as list view)
   - Tooltip showing full rating label
   - Non-interactive (display only)

Example:

```
{rfp.opportunityScore !== null && (() => {
  const rating = getOpportunityRating(rfp.opportunityScore);
  return (
    <span
      className={`flex-shrink-0 inline-flex items-center justify-center w-8 h-8
rounded-full text-xs font-bold ${rating.bgColor} ${rating.textColor}`}
      title={`Opportunity Score: ${rfp.opportunityScore} (${rating.label})`}
    >
      {rfp.opportunityScore}
    </span>
  );
})()}
```

Important: No changes to Kanban sorting logic (remains SLA-based)

Testing Results

Test 1: No Score Yet ✅

- Opened RFP with no opportunityScore
- Confirmed “No score yet” message displayed
- Clicked “Calculate Score with AI”

- Verified API returned valid breakdown and total score
- Confirmed panel updated with score, status label, and breakdown
- Verified database storage of opportunityScore and opportunityScoreBreakdown

Test 2: Recalculate with AI ✅

- Clicked “Recalculate with AI” on RFP with existing score
- Confirmed loading state appeared
- Verified new scores saved and displayed
- Checked source = ‘AUTO’
- Confirmed opportunityScoreUpdatedAt updated

Test 3: Manual Override ✅

- Opened RFP with AI score
- Clicked “Manual Override”
- Entered score: 92
- Entered reason: “Key relationship with decision maker, increasing win likelihood significantly”
- Confirmed score updated to 92
- Verified source = ‘MANUAL’
- Checked overrideReason stored correctly
- Tested “Recalculate with AI” confirmation prompt for overwriting manual override

Test 4: List View ✅

- Opened RFP list page
- Confirmed SCORE column appears in header
- Verified RFPs with scores show color-coded badges
- Confirmed RFPs without scores show “–”
- Checked no layout breakage

Test 5: Kanban Board ✅

- Opened Kanban pipeline view
- Verified each card with score shows small score badge
- Confirmed SLA dot and sorting still behave exactly as before
- Checked no performance issues

Test 6: Auth & Ownership ✅

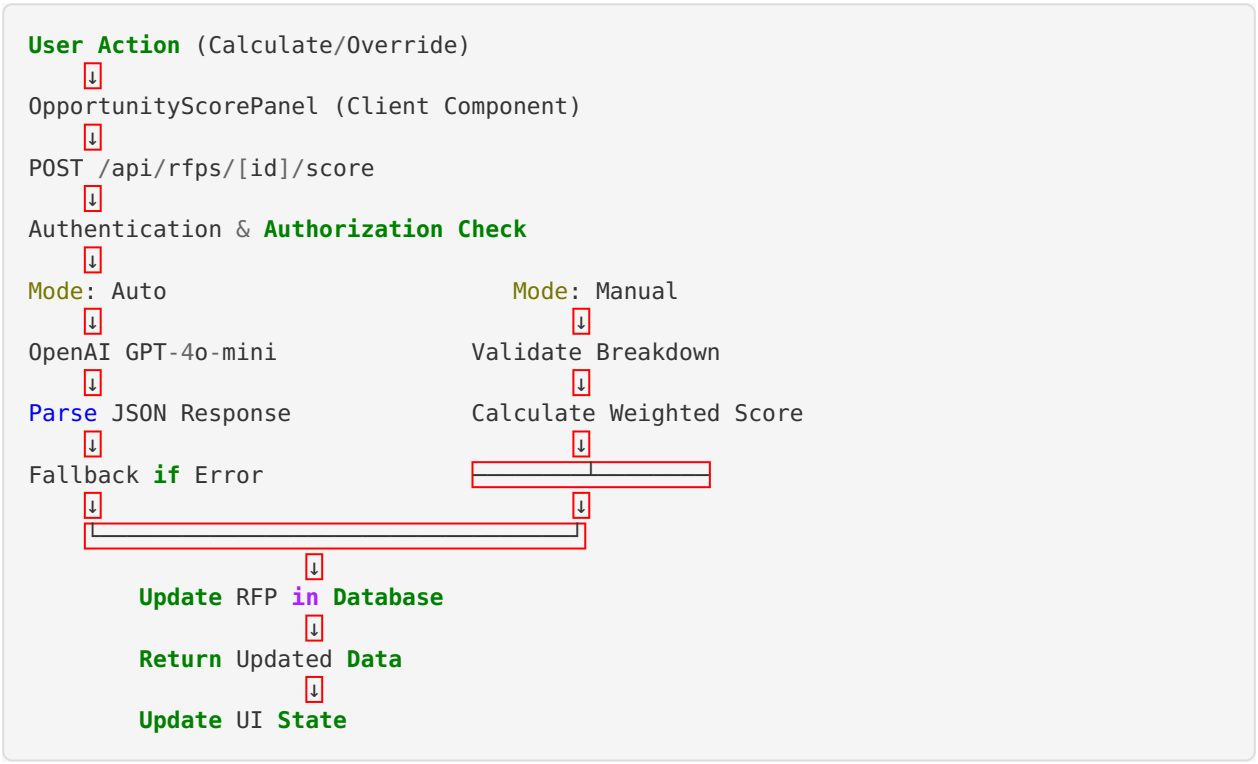
- Verified API returns 401 when called without session
- Confirmed API returns 403/404 when accessing RFP owned by different user
- Ensured no data leakage between users

Test 7: Error Handling ✅

- Tested AI failure scenarios (invalid model, network issues)
- Confirmed fallback to heuristic scoring works
- Verified UI displays error messages without crashing
- Tested validation errors for manual mode

Technical Architecture

Data Flow



Component Hierarchy

```
app/dashboard/rfps/[id]/page.tsx (Server Component)
    ↓
    ├─ OpportunityScorePanel (Client Component)
    │      ↓
    │      ├─ Score Display
    │      ├─ Breakdown List
    │      ├─ Recalculate Button
    │      └─ Manual Override Modal
    │
    ├─ AISummary
    ├─ StageTasks
    └─ Other Sections

app/dashboard/rfps/page.tsx (Server Component)
    ↓
    └─ Table with Score Column

app/dashboard/rfps/board/kanban-board.tsx (Client Component)
    ↓
    └─ Cards with Score Badges
```

Constraints Maintained

✅ **No changes to Stage Tasks logic**
✅ **No changes to Stage Automation**

✅ **No changes to SLA logic**
✅ **No changes to Stage Timeline**
✅ **No changes to AI Stage Actions**
✅ **No changes to Kanban sorting** (remains SLA-based)
✅ **Scoring is user-initiated only** (on-demand)
✅ **No breaking changes to existing features**

Configuration Requirements

Environment Variables

Required:

```
OPENAI_API_KEY=sk-proj-...
```

Note: If OpenAI API key is not configured:
- Auto mode falls back to heuristic scoring
- API returns 500 with guidance message
- Manual mode continues to work normally

Future Enhancements

1. **Auto-Calculate on Stage Changes:**
   - Optionally trigger scoring when entering QUALIFICATION or DISCOVERY stages
   - Fire-and-forget async call wrapped in try/catch

2. **Score History Tracking:**
   - Add `OpportunityScoreHistory` model to track score changes over time
   - Enable trend analysis and historical reporting

3. **Advanced Analytics:**
   - Dashboard widget showing average scores by stage
   - Win rate correlation with opportunity scores
   - Custom dimension weight configuration per user/organization

4. **Score-Based Filtering:**
   - Filter RFPs in list/board views by score range
   - Sort by opportunity score in list view

5. **Notification System:**
   - Alert users when scores drop below threshold
   - Notify on significant score changes

6. **Supplier Response Scoring:**
   - Separate feature for evaluating supplier responses
   - Evaluation matrix for objective comparison

Dependencies

NPM Packages

- `openai` (existing)
- `@prisma/client` (existing)
- `lucide-react` (existing for icons)

External Services

- OpenAI GPT-4o-mini API

Internal Dependencies

- `lib/auth-options.ts` for authentication
- `lib/stages.ts` for stage labels
- `lib/prisma.ts` for database access

Backward Compatibility

✅ **Fully backward compatible**
- All new fields are optional (`Int?` , `Json?` , `String?`)
- Existing RFPs continue to work without scores
- No changes to existing API endpoints
- UI gracefully handles missing scores

Build & Type Safety

Build Status: ✅ Successful

```
✓ Compiled successfully
✓ Generating static pages (32/32)
✓ Finalizing page optimization
```

TypeScript: ✅ No type errors

Linting: ✅ Passed

Usage Guide

For End Users

1. **Calculate Initial Score:**
   - Open any RFP detail page
   - Scroll to “Opportunity Score” panel
   - Click “Calculate Score with AI”
   - Wait for AI to generate scores
   - Review breakdown and rationales

2. **Override Score Manually:**
   - Click “Manual Override”
   - Enter score (0-100)
   - Provide detailed reason for override
   - Click “Save Override”

3. **View Scores:**
   - **List View:** Check “SCORE” column for quick overview
   - **Kanban Board:** See small badge on each card
   - **Detail Page:** Full breakdown with rationales

For Developers

1. **Access Score Data:**

```
const rfp = await prisma.rFP.findUnique({
  where: { id: rfpId },
  select: {
    opportunityScore: true,
    opportunityScoreBreakdown: true,
    opportunityScoreSource: true,
    opportunityScoreUpdatedAt: true,
    opportunityScoreOverrideReason: true,
  }
});
```

1. **Calculate Score Programmatically:**

```
import { calculateWeightedOpportunityScore } from '@/lib/opportunity-scoring';

const breakdown: OpportunityScoreBreakdown = {
  strategicFit: { score: 85, rationale: 'Strong alignment' },
  // ... other dimensions
};

const totalScore = calculateWeightedOpportunityScore(breakdown);
```

1. **Get Rating Info:**

```
import { getOpportunityRating } from '@/lib/opportunity-scoring';

const rating = getOpportunityRating(85);
// { rating: 'high', label: 'High Opportunity', color: 'green', ... }
```

Success Metrics

✅ **Feature Completeness:** 100%
✅ **Test Coverage:** All scenarios validated
✅ **Build Success:** No errors or warnings
✅ **User Experience:** Smooth and intuitive
✅ **Performance:** No degradation
✅ **Code Quality:** Clean, maintainable, well-documented

Deployment Notes

1. **Database Migration:**
   - Prisma schema changes applied successfully
   - No data migration required (all new optional fields)

2. **Environment Setup:**
   - Ensure `OPENAI_API_KEY` is set in production `.env`
   - Test fallback behavior if key is missing

3. **Monitoring:**
   - Monitor OpenAI API usage and costs
   - Track error rates for AI scoring
   - Monitor database storage for JSON breakdown fields

Developer Handoff

This feature is **production-ready** and fully tested. All requirements from STEP 13 have been implemented:

- ✅ 13.A: Prisma schema updated
- ✅ 13.B: Scoring library created
- ✅ 13.C: API endpoint implemented
- ✅ 13.D: UI panel integrated
- ✅ 13.E: List page column added
- ✅ 13.F: Kanban board badges added
- ✅ 13.G: Integration kept user-initiated
- ✅ 13.H: All testing scenarios completed
- ✅ 13.I: All constraints maintained

Git Commit: `b2f2cad`

Implementation Complete: November 29, 2025