

PERFORMANCE MANAGEMENT SYSTEM · V1.0.0

# Database Guide

Entity-relationship diagrams, every table, relationships, indexes, and column-level explanations.

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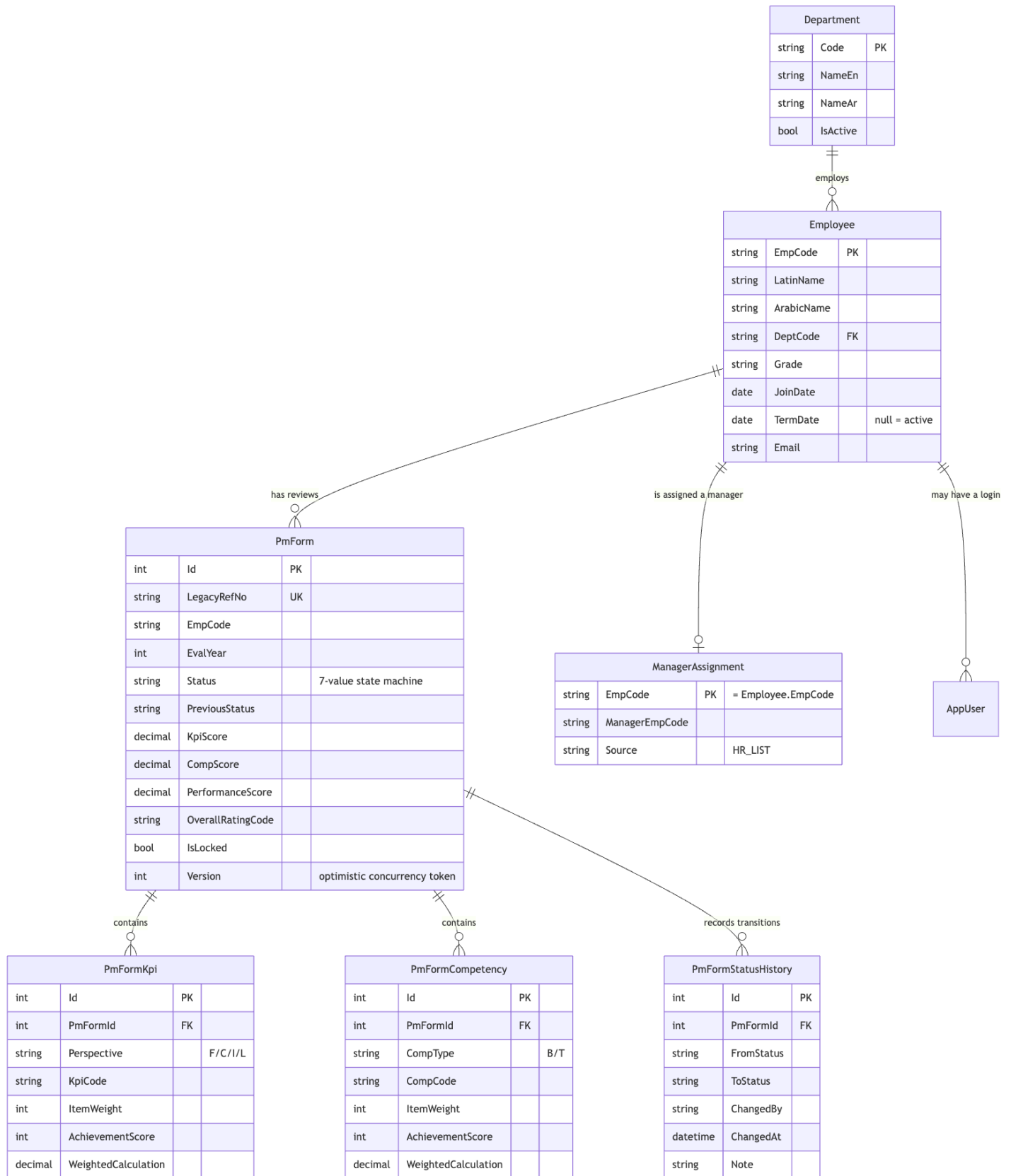
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# 1. Overview

PostgreSQL 16, accessed exclusively through Entity Framework Core 8 ( `PmDbContext` ). 22 tables, applied through 11 sequential migrations (see §8). There is no direct SQL or stored-procedure logic — all business rules live in the `C#` service layer, and the schema itself is intentionally simple: one row per real-world record, snapshot fields called out explicitly where they're a deliberate design choice rather than duplication.

## 2. ER diagram — PM workflow core



**PmForm(EmpCode, EvalYear)** carries a unique index — the schema itself guarantees at most one review per employee per year, not just application-level convention. Name/department/grade fields on **PmForm** are point-in-time **snapshots**, not live foreign keys, by design — a completed review must always read back the way it looked when it was actually reviewed.



## 4. Table reference: workflow core

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### Employee

The PM-relevant subset of the legacy employee master. `EmpCode` (string, primary key) — the 4-digit legacy employee code, also used as the login username for non-admin accounts. `TermDate` null means active ( `IsActive` is a computed property, not a stored column). `Source` distinguishes rows synthesized from the legacy import ( `HDR_SNAPSHOT` ) from ones entered directly in this app ( `MANUAL` ).

### Department / Designation / Section

Simple bilingual code/name reference tables. Departments carry an `IsActive` flag (never hard-deleted — employees may reference a disabled one historically).

### ManagerAssignment

One row per employee ( `EmpCode` is the primary key), pointing at their HR-designated direct manager ( `ManagerEmpCode` ). Deliberately separate from any org-chart hierarchy — some HR-designated PM reviewers are not the employee's formal line manager.

### PmForm

The authoritative record for one employee's review in one year — the legacy system's HDR (header) row. Key columns:

`Status` / `PreviousStatus` (the seven-value state machine), `KpiScore` / `CompScore` / `PerformanceScore` (computed, persisted), `IsLocked` (prevents edits mid-review at certain stages), `Version` (EF Core optimistic-concurrency token, incremented on every transition).

### PmFormKpi / PmFormCompetency

Line items belonging to one `PmForm` (cascade-deleted with it). Each carries its own weight, achievement score, and computed weighted contribution — ( `PmFormId`, `RecordSeq` ) is unique per form.

### PmFormStatusHistory

One row per state transition — the "Workflow Timeline" shown on the Workflow Administration Details page and used as the honest, literal audit of every status change (as distinct from the separate `AuditLog` table, which records *administrative* actions specifically).

## 5. Table reference: reference/master data

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### KpiMaster / CompetencyMaster

The catalog of KPIs/competencies a manager can attach to a review, each with a suggested weight range, applicable department list ( `DeptCsv` , comma-separated or `*` for all), and bilingual name/description/formula text.

### JobFamily

Maps a comma-separated grade list ( `GradesCsv` ) to a KPI/competency weight split ( `KpiWeight` + `CompWeight` , must sum to 100) — this is what determines, for example, that a grade-7 "Middle Management" employee's overall score is 60% KPI-weighted and 40% competency-weighted.

### RatingScale

Score-band-to-rating-label mapping (e.g. 90–94 → "Exceed Expectations"), bilingual.

### EmployeeException

Data-driven, per-employee rule overrides ( `RuleCode` : `PERSPECTIVE_MIN_EXEMPT` , `KPI_50_50` , `SELF_MANAGER` , `BRANCH_VIEWER` ), each with an optional effective date range — lets HR grant a narrow, auditable, time-bound exception without a code change.

## 6. Table reference: users, security & system

### AppUser / UserRole

Login accounts. `FailedLoginAttempts` / `LockedOutUntil` implement account lockout directly on the row; `PreferredCulture` persists a user's language choice across devices. `UserRole` is a simple one-to-many (a user may hold zero, one, or both of `HR_ADMIN` / `VIEWER` ).

### SystemSettings

Singleton row ( `Id = 1` ) holding every admin-configurable setting across seven categories (General, Performance Review, Email, Authentication, Security, Dashboard, Branding). `SmtppasswordProtected` and `LoginAsVerificationPasswordProtected` are encrypted via ASP.NET Core Data Protection, never stored in plaintext.

### EmailLog

One row per dispatch attempt. `Status` is one of `SENT` / `FAILED` / `LOGGED` (no SMTP configured)/ `DISABLED` / `SKIPPED_NO_RECIPIENT` / `SKIPPED_DUPLICATE` . `IdempotencyKey` prevents the same transition's email being sent twice.

### AuditLog

Append-only administrative action trail. `EntityType` / `EntityId` let the Workflow Administration Details page pull exactly the entries for one review; `Action` carries a human-readable verb phrase (e.g. `"Workflow Administration: Return to Employee"` ).

### ImpersonationLog

One row per "Login As" session — opened on impersonation start, closed ( `EndedAt` ) on "Return to Administrator" or logout. Never deleted; this is the accountability record for that feature specifically, independent of (and not gated by) the general audit-logging toggle.

### ScheduledJobRun

One row per execution of a Quartz job — necessary because the scheduler's own in-memory job store does not retain history across an application restart. Read by the Scheduled Jobs page for last-run status/duration/result.

### Notification

One row per (user, event) — events affecting several people are fanned out into one row per recipient at creation time rather than modeled as a broadcast, keeping "mark as read" simple and per-user.

## 7. Indexes

| TABLE              | INDEX                                    | PURPOSE                                                                                          |
|--------------------|------------------------------------------|--------------------------------------------------------------------------------------------------|
| PmForms            | (EmpCode, EvalYear) unique               | One review per employee per year, enforced at the database level.                                |
| PmForms            | LegacyRefNo unique                       | Legacy reference-number lookup.                                                                  |
| PmForms            | EvalYear                                 | Dashboard/summary filtering by year alone.                                                       |
| PmForms            | (EvalYear, Status)                       | The "this year, this status" pattern used by Workflow Administration search and PM Form Summary. |
| AuditLogs          | (EntityType, EntityId)                   | Per-record audit history — hit on every Workflow Administration Details page view.               |
| AuditLogs          | OccurredAt , EmpCode , DeptCode , Action | Audit-trail filtering.                                                                           |
| ManagerAssignments | ManagerEmpCode                           | Every "my team"/manager-filtered search and report.                                              |
| AppUsers           | UserName unique                          | Login lookup.                                                                                    |
| EmailLogs          | IdempotencyKey , FormLegacyRefNo         | Duplicate-send prevention; per-form email history.                                               |
| ImpersonationLogs  | SessionId unique, StartedAt              | Session correlation; recent-history ordering.                                                    |

## 8. Migrations

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11 migrations, applied automatically on application startup ( `Database.MigrateAsync()` ), in order: initial schema, impersonation log, system settings, application base URL, missing-index pass, department description/active flag, Phase-9 settings and user security fields, audit log, scheduled job run, notifications, Phase-11/12 settings and preferred-culture, and the most recent missing-index pass (PmForm status/year composite, manager-assignment, audit entity-type/id).

### APPLYING MANUALLY

```
dotnet ef database update --project src/PerformanceManagement.Core --startup-project
src/PerformanceManagement.Web
```

 — only needed if you deliberately disable the automatic startup migration.