

CASE STUDY #1

Weekly Task View That Did Not Break When the Week Did

Black Acre HRM -- Task Scheduling and Calendar Logic

Project	Black Acre -- Human Resource Management Platform
Area	Task Scheduling, Calendar Logic, Timezone Handling
Difficulty	Medium-High -- Date arithmetic, multi-timezone teams, edge cases
Outcome	Accurate, personalized weekly task view for all employees regardless of timezone

Background

Black Acre was built to give employees a clear weekly view of their assigned tasks, similar to how tools like Jira and Asana present sprint boards. The requirement sounded simple: show each employee their tasks for the current week. In practice, getting that weekly view right took a lot more thought than expected.

The Problem

The first implementation defined a week as Monday through Sunday UTC. That worked fine for employees sitting in the same timezone as the server. It fell apart the moment the user base became distributed across timezones.

Problem 1 -- Timezone Mismatch

An employee in Karachi (UTC+5) opening the app at 11pm on a Sunday was still in their Sunday, but the server had already rolled over to Monday UTC. Their weekly view would silently advance to the next week, hiding tasks that were still due before midnight for them. The employee had no idea their view had shifted.

User Impact

Employees working late on Sunday would see their Monday tasks instead of their remaining Sunday tasks, causing missed deadlines and confused task ownership. The issue was invisible because the UI showed the correct week label in server time, not local time.

Problem 2 -- Tasks Spanning Multiple Weeks

Longer tasks assigned with a start date in one week and a deadline in another needed to appear in both weekly views. The first build only showed tasks whose start date fell within the current week. A task starting on Thursday and due the following Wednesday was invisible on Wednesday when the employee needed it most.

Problem 3 -- Manager vs Employee Week Boundaries

A manager in London assigning a task to an employee in Lahore on a Friday afternoon their time was actually assigning it on a Saturday morning Lahore time. The employee would see the task appear in the following week's view, not the current one the manager expected it to land in. This caused repeated back-and-forth between managers and employees about when tasks were actually assigned.

The Solution

1. User Timezone as the Source of Truth

Each user account stored a preferred timezone. Every weekly view calculation was performed in the user's local timezone, not server time. The week boundaries (Monday 00:00 to Sunday 23:59) were computed in that local timezone and then converted to UTC for the database query. The server never assumed its own timezone applied to the user.

2. Overlap-Based Task Inclusion

The query logic was rewritten to include any task whose active period overlapped with the user's current week, not just tasks whose start date fell within it. A task was included in a weekly view if its start date was before or equal to the week's end, and its due date was on or after the week's start. This meant tasks spanning multiple weeks appeared in every week they were active, with a clear visual indicator showing the full date range.

3. Assignment Timestamp Anchored to Assignee Timezone

When a manager assigned a task, the system recorded the assignment in UTC but resolved the display week for the assignee using the assignee's timezone. A task assigned Friday 5pm London time would appear in the Lahore employee's current week view because it arrived before Saturday ended for them. Managers also saw a confirmation showing which week the task would land in for each assignee.

Problem	Fix Applied
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Weekly view shifts silently at UTC midnight	Week boundaries computed in user's local timezone
Multi-week tasks disappear mid-assignment	Overlap inclusion logic replacing start-date-only filter
Manager and employee see different assignment weeks	Assignment display week resolved per assignee timezone
Employees miss deadlines due to shifted view	Week label shows local date range, not server date range

Outcome

After the fix, the weekly view became genuinely reliable. Employees in different timezones all saw a view anchored to their own week. Multi-week tasks stayed visible throughout their active period. Manager-to-employee assignment confusion dropped sharply because both parties now saw the same effective week for every task. The change required no user-facing UI redesign, just correct data underneath.

Key Takeaway

Date and time bugs are among the quietest and most damaging in any collaborative platform. They do not throw errors. They just silently show the wrong data to the wrong person at the wrong time. Anchoring every time-sensitive calculation to the user's local timezone from day one is not a nice-to-have. It is a correctness requirement.

-- Ehsan