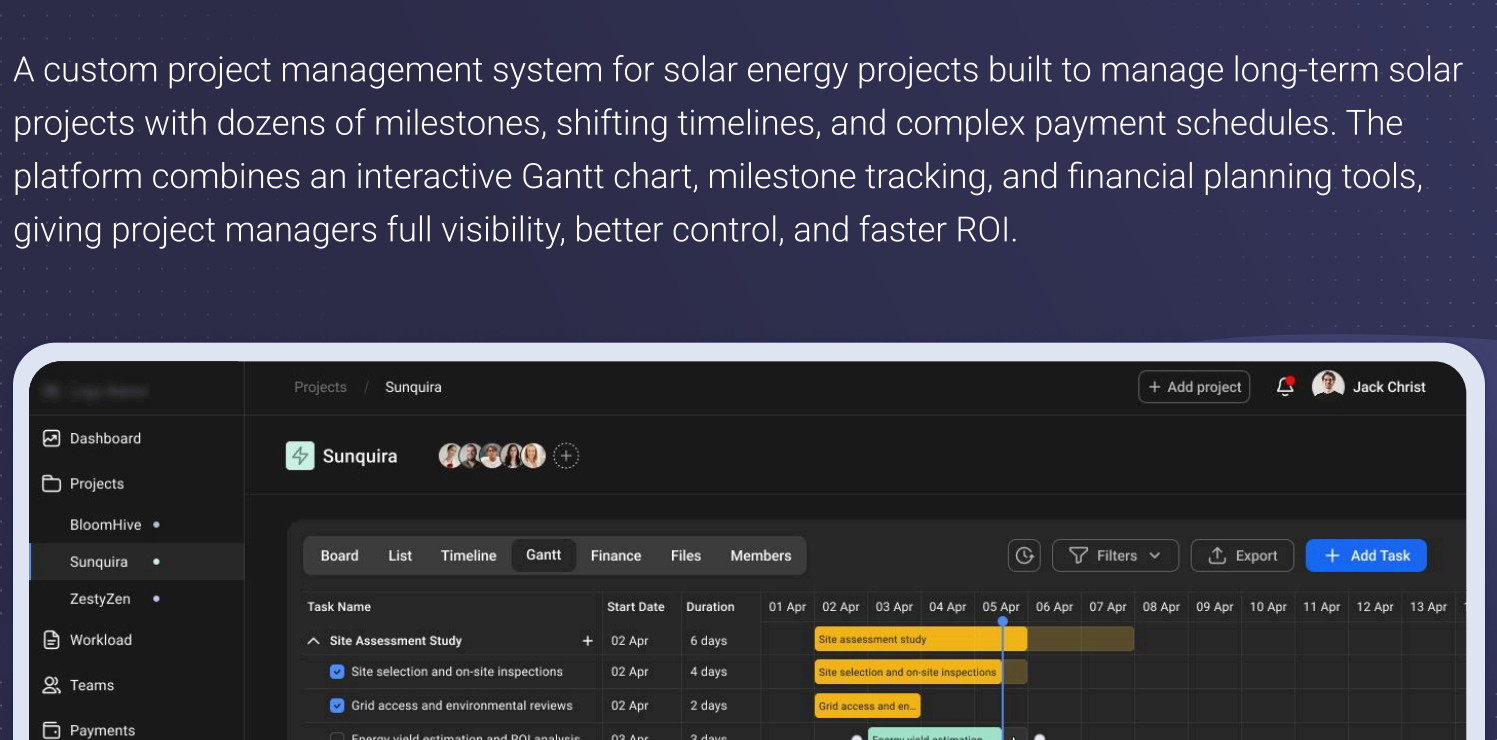
Custom Project Management Gantt Chart Software for Renewable Energy Projects

A custom project management system for solar energy projects built to manage long-term solar projects with dozens of milestones, shifting timelines, and complex payment schedules. The platform combines an interactive Gantt chart, milestone tracking, and financial planning tools, giving project managers full visibility, better control, and faster ROI.



Project in Facts

Industry
Renewable Energy / Solar

Region
USA

Project life (months)
5+

Business
Small-sized

Estimated Man-Hours
2 000+

Key technologies
DHTMLX · Node.js · MySQL · AWS

Business Challenge

A client from a solar farming business that specializes in the development, construction, and ongoing operation of solar farms asked for our custom project management system development services. To manage business activities, they previously relied on a popular project management software but encountered significant limitations in terms of customization, data transparency, and flexibility for visualizing solar energy project timelines. At first, task lists and the basic timeline view worked well enough for general team coordination. However, as the business scaled and their internal workflows became more complex due to the increasing amount of long-term projects, it became difficult to manage dozens of interdependent tasks, regulatory approval stages, and phased equipment deliveries.

For a company managing multiple solar farm projects, having granular control over timelines, resource allocation, and financial milestones is critical to ensuring successful delivery, regulatory compliance, and ROI tracking. Therefore, customer's goal was to create a dedicated solar energy project management tool built specifically around the workflows and realities of solar energy projects — with a strong focus on **Gantt-based visualization**, milestone tracking (including financials tied to solar construction phases and energy delivery timelines), and seamless control over project data at every stage.

01 **Rigid Tools for Complex Project Lifecycles:** the client managed solar projects using a basic Gantt chart tool, which couldn't establish logical relationships between project stages (development, permitting, construction, etc.). This limitation led to delays, inefficiencies, and reliance on manual workarounds;

02 **Siloed Data Limiting Cross-Team Coordination:** real-time schedule changes weren't visible across departments (e.g., construction teams couldn't see updated permit approval dates from legal). This lack of visibility led to misaligned resource allocation and avoidable rework expenses;

03 **Disconnected Financial and Operational Tracking:** the payment milestones managed separately from project schedules in spreadsheets, causing misalignment between finances and progress. This raised risks of missed payments, delayed vendor payouts, and inaccurate ROI tracking during key phases;

04 **Lack of Audit Trails for Long-Term Projects:** missing historical versioning for task timelines and dependencies prevented tracking changes or reverting errors in long-term projects, undermining accountability during regulatory audits and blocking analysis of past delays to optimize future solar farm deployments.

Solution

To ensure the client's challenges were fully addressed, we developed a custom solar project management software solution — a fully customized web-based system focused on Gantt chart visualization, timeline management, and financial tracking. Also, the customer was familiar with DHTMLX Gantt and wanted to use it for this solar energy management software. The key objective was to build a seamless, reliable data integration process that ensures compatibility, efficiency, and flexibility for visualizing complex solar project timelines, with the added ability to track and display previous project states.

The PM software for solar energy was designed to align with the customer's operational workflows, supporting the full lifecycle of solar farm projects — from development through construction to ongoing operation. To ensure clarity in project ownership while maintaining data integrity, it should provide seamless CRUD (Create, Read, Update, and Delete) operations for project data, data export options, and robust user role management with differentiated access rights based on user roles (Program Manager, Project Manager, Employee, Guest).

This **structured permission model** helped the client to streamline internal processes, reduce operational risks, and ensure data integrity across all ongoing and future solar energy projects. Program Managers gained full control over all projects and tasks, enabling them to oversee multiple solar developments with ease and maintain consistency across operations. Project Managers now hold full CRUD permissions within their assigned projects only, supporting structured and secure workflows. Employees were granted read-only access, ensuring transparency without the risk of accidental data changes. Guests remain restricted to the login screen only, further enhancing system security.

Project and task management tailored to user roles , ensuring each user only sees and edits data relevant to their responsibilities;

Comprehensive payment info displayed with detailed attributes like payment date, amount, and status, helping align financial flows with project progress;

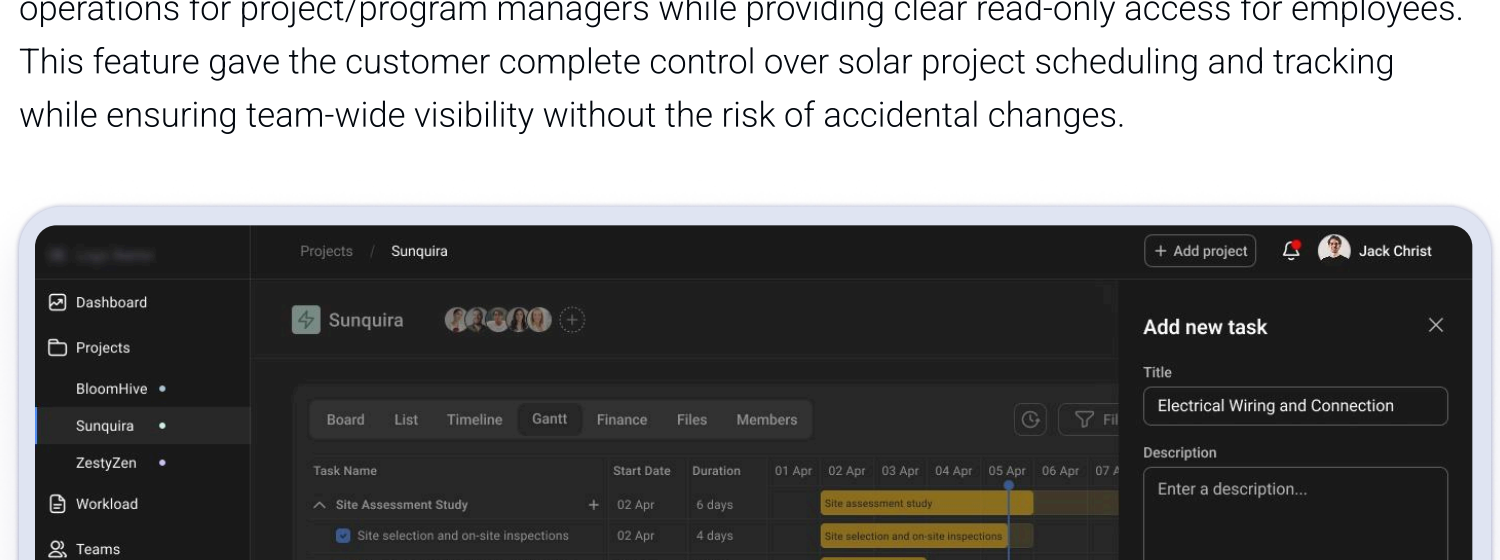
Historical data tracking and versioning for full auditability , allowing users to track progress over time, view past states, and restore previous versions when needed;

Seamless data export to Excel, PDF, and MPP formats, letting users export up-to-date project schedules and reports in various formats for reporting, compliance, or collaboration outside the solar project management system.

> When managing complex, long-term projects like solar farm construction, having full visibility and control over different data — from schedules to financial milestones — is critical. Our mission was to transform static Gantt charts into a living system that could mirror the fluidity of solar farm development while maintaining data integrity across years-long projects. This redefined how renewable teams collaborate across time zones, spreadsheets, and siloed tools.
>
> **Ihar Halchuk**
> Lead PM at XB Software

Advanced Gantt Charts

At the core of this solar project management system is a highly interactive Gantt chart for renewable energy projects that visualizes tasks, timelines, and milestones. It supports full CRUD operations for project/program managers while providing clear read-only access for employees. This feature gave the customer complete control over solar project scheduling and tracking while ensuring team-wide visibility without the risk of accidental changes.



Task and Timeline Management

Enabled project and program managers to efficiently manage complex solar energy project structures with ease. Thanks to drag-and-drop editing, they could quickly adjust schedules, reassign tasks, and keep timelines aligned without relying on external tools. This directly addressed the challenge of how to manage solar construction projects more efficiently.

Multi-scale Views

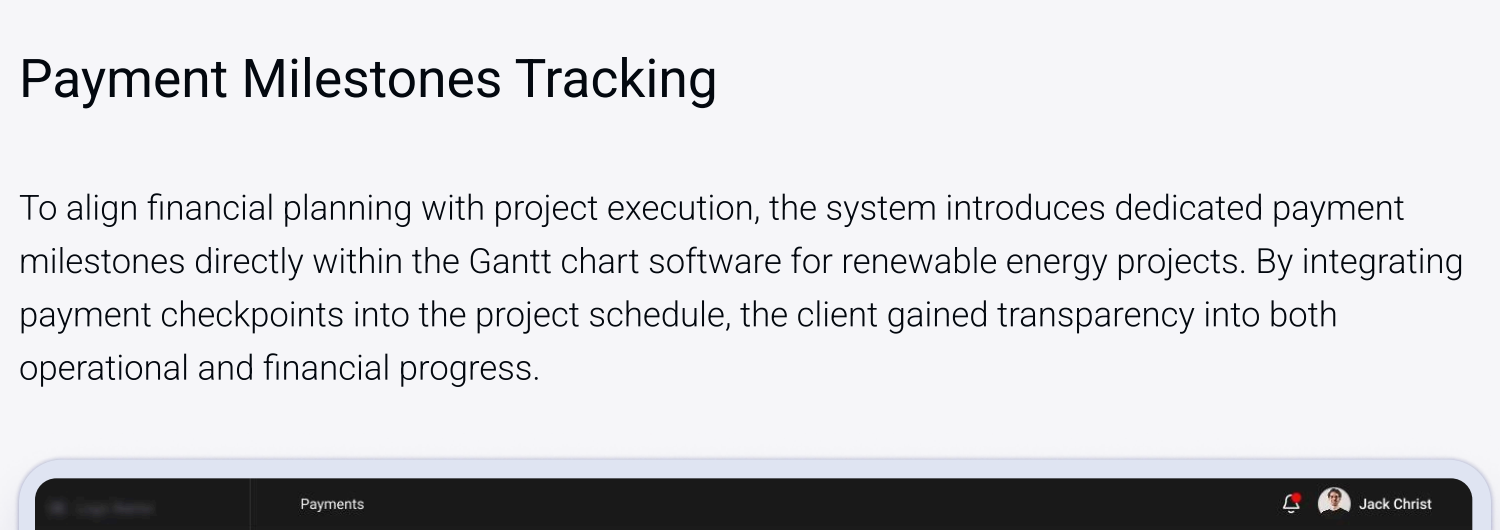
Allowed the teams to switch effortlessly between weekly and monthly views depending on the project phase — from detailed construction scheduling to high-level management overviews during operations. This flexibility improved communication between operational teams and leadership, aligning everyone on key milestones. Ensured that any changes made in the grid view were reflected instantly in the Gantt chart and vice versa.

Grid View for Structured Editing

To complement the visual Gantt interface, we implemented a dedicated grid view that gave the customer a structured, spreadsheet-like environment for managing solar project data. This feature provided an efficient alternative for teams who prefer precise data manipulation over graphical editing, speeding up updates for complex solar projects. It streamlined updates, especially for large datasets typical in renewable energy project management software.

Payment Milestones Tracking

To align financial planning with project execution, the system introduces dedicated payment milestones directly within the Gantt chart software for renewable energy projects. By integrating payment checkpoints into the project schedule, the client gained transparency into both operational and financial progress.



Detailed Milestone Attributes

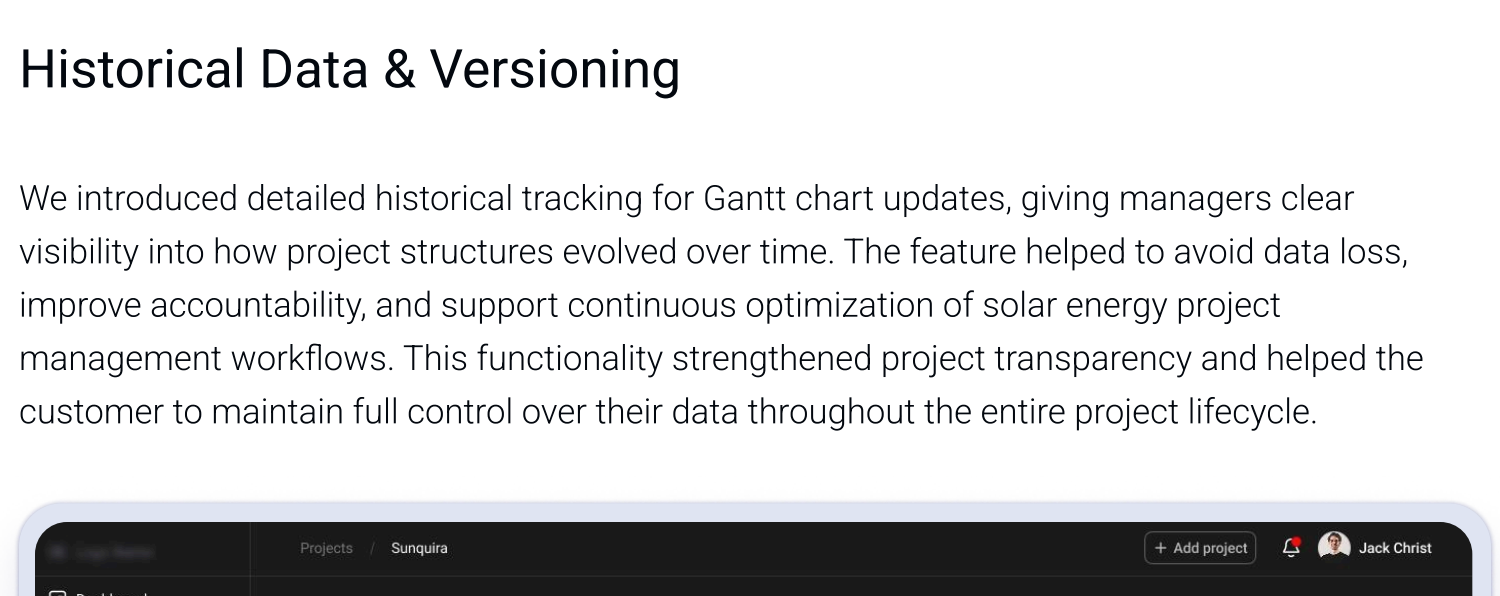
It is now possible to specify critical financial details (payment dates, amounts, VAT and payment status) within each milestone. This eliminated the need for separate spreadsheets or manual tracking and centralized all key data in one solar energy management software.

Financial Visibility

Integrating payment milestones into the Gantt chart provided with a clear, unified view of how financial obligations aligned with project progress. This improved budget forecasting, enhanced reporting accuracy, and allowed leadership to make faster, data-driven decisions.

Historical Data & Versioning

We introduced detailed historical tracking for Gantt chart updates, giving managers clear visibility into how project structures evolved over time. The feature helped to avoid data loss, improve accountability, and support continuous optimization of solar energy project management workflows. This functionality strengthened project transparency and helped the customer to maintain full control over their data throughout the entire project lifecycle.



Task and Link History

Allowed to track every change made to tasks and dependencies with timestamps, user details, and updated values — ensuring a clear audit trail for internal reviews. This made it easier for project managers to explain decisions and validate timelines during audits or reporting.

Restore Previous Versions

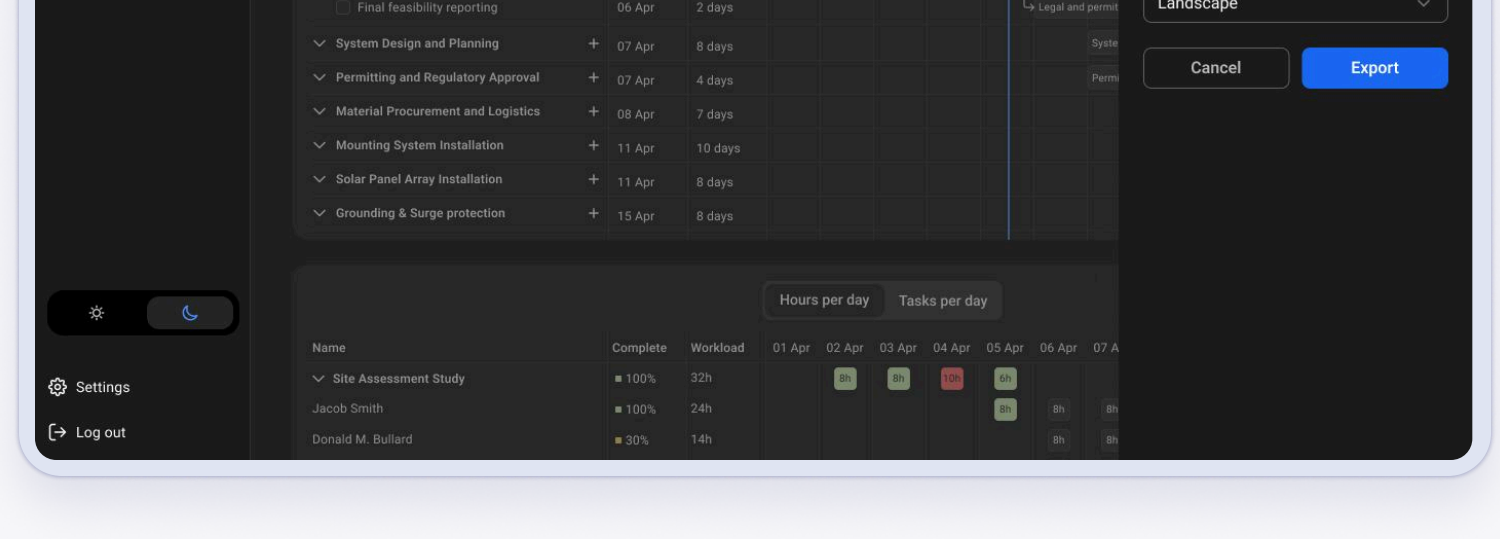
Enabled teams to confidently roll back to earlier project states when needed, minimizing risks from accidental changes or misaligned updates. This gave the client peace of mind knowing they could recover previous versions without compromising project integrity — a crucial benefit of robust solar energy software.

Data Synchronization Across Views

Ensured all updates were reflected instantly between Gantt and grid views, providing a unified, reliable source of truth for managing solar energy projects. This consistency reduced confusion between teams and streamlined data management across departments — ideal for project management tools for energy sector use cases.

Data Export & Integrations

To maximize flexibility and ensure smooth solar project management workflows, we implemented robust export functions and data import capabilities tailored to the client's existing toolset. This made it easy to share insights externally and integrate the new system into their broader project ecosystem. It also bridged the legacy platforms and new solution seamlessly, avoiding vendor lock-in and empowering efficient project collaboration across teams.



Export to Excel, PDF, and MS Project

Allowed to quickly generate project timeline reports and share them with stakeholders or auditors in familiar, widely accepted formats. This streamlined communication and documentation, reducing time spent on manual report preparation.

Previous System Import Support

Enabled data migration from the previously used PM system via CSV uploads, minimizing disruption and preserving historical project information. This ensured a smooth transition without losing valuable data during the switch to the new system.

Consistent Data Formats and API Integration

Maintained compatibility with the client's existing reporting and analysis tools by enforcing standardized export formats and providing dedicated API endpoints for data exchange. This reinforced data integrity and simplified ongoing project data management.

Tools & Technologies

To help our client quickly transition from the previous PM solution and gain full control over their solar and renewables management software workflows, we prioritized ready-to-use components and reliable technologies over building everything from scratch. This approach allowed us to focus on business value, not technical overhead.

Since the heart of the solution was advanced Gantt chart functionality and the customer favored the DHTMLX Gantt chart library, we based the system on the DHTMLX JavaScript UI components. Besides the Gantt charts, they allowed us to provide our client with robust scheduling tools, grids, and export options out of the box — helping to achieve faster time-to-market and minimize development costs.

For backend and data management, we used Node.js and **MySQL**, a proven stack ensuring stability and scalability. The application was deployed on **AWS**, giving the client secure, browser-based access without worrying about infrastructure maintenance.

This technology choice empowered our team to deliver a transparent, user-friendly, and scalable project management solution for renewable energy business tailored to the solar sector's needs.

DHTMLX Gantt, Suite, Export, etc — specifically chosen by the client for their ability to handle complex project timelines, dependencies, and visual reporting with minimal need for custom components. DHTMLX components helped to provide advanced project timeline visualization, task scheduling, and dependency management essential for managing complex renewable energy projects. Besides that, they supplied additional interface components (forms, grids, etc.) that complemented the Gantt chart, reducing development time, and enabled export to PDF, MPP, and PNG formats, critical for reporting and compliance in project management.

Node.js + MySQL is a well-established backend pairing that ensures fast API development, performance, and scalability — ideal for managing structured project data and supporting role-based access. Node.js powered a reliable API layer for business logic and seamless integration between frontend components and the database. Its asynchronous nature ensured performance under heavy data loads. While MySQL provided structured, relational data storage with secure access control, supporting hierarchical project and task structures typical in complex engineering projects.

AWS offered a secure, scalable cloud environment for hosting the application, ensuring high availability and secure browser-based access for distributed teams. It provided a hassle-free infrastructure, perfectly suited to a growing company in the renewable energy sector.

Result

Looking at the rapid growth and increasing complexity of the renewable energy sector, companies focused on solar infrastructure must ensure their internal systems support both transparency and efficiency. With the solution we delivered, our client gained exactly that — a reliable, tailored tool fully aligned with their business needs and free from the limitations of off-the-shelf SaaS platforms:

- the client can now manage and analyze project structures, timelines, and historical changes without relying on third-party services or external data exports;
- visualizing tasks, dependencies, and financial milestones in one unified system with Gantt interface improved operational clarity and helped the team track progress more accurately;
- export options to Excel, PDF, and MS Project allowed teams to easily share project updates with investors, partners, and internal stakeholders without additional tools;
- replacing an incomplete ready-made system with a custom-built solution removed previous blockers, enabled deeper data analysis, and allowed full ownership over both functionality and future development.

As a result, the custom-built solar energy project management system enabled the client to **scale faster, launch new solar projects more quickly**, and **streamline planning** with full operational visibility across every stage.