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Streamlining EV Infrastructure Quoting with Smart Automation

Executive Summary

In the rapidly evolving Electric Vehicle (EV) infrastructure sector, the ability to provide accurate, professional, and detailed quotes quickly is a significant competitive advantage. This project involved developing a specialized Quote Generator within Google Sheets to replace manual, fragmented quoting methods. By centralizing material and groundwork costs and integrating AI, the system reduced project quote lead times while increasing technical accuracy.

The Challenge

Before this solution, quoting complex EV installations, required manually cross-referencing multiple supplier lists, estimating groundwork variables, and drafting technical "Descriptions of Works" from scratch. This manual process was:

- **Time-Consuming:** Gathering costs for specific chargers (e.g., Nexblue Edge) and associated cabling (NYY or SWA) took hours.
- **Inconsistent:** Manual calculations for margins and overheads often led to pricing fluctuations.
- **Technically Demanding:** Writing professional project designs for every quote created a bottleneck for the sales team.

The Solution: A Unified Digital Ecosystem

The new system was built on a multi-tabbed Google Sheets architecture, serving as a single source of truth for all project variables.

1. Centralized Cost Management

The system utilizes dedicated databases for **Install Items** and **Ground Works Costs**. This allows the user to select components—from a **400A TP+N Metal Fused Switch** to **trenching in tarmac**—and instantly pull current unit costs.

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- **Bill of Quantities (BoQ):** A dynamic tab that aggregates hardware, labor, and materials, ensuring no component is overlooked.
- **Automated Margins:** Formulas automatically calculate the "Swift Margin" and project overheads based on total project value, ensuring consistent profitability across different sites.

2. Gemini AI Integration

To solve the technical writing bottleneck, the system incorporates Gemini via API.

- **Project Design:** Using a specific "Design Prompt," Gemini analyzes the project scope (e.g., number of chargers, mounting types, and cable lengths) to generate a detailed design overview for the client.
- **Description of Works:** The AI generates an indented, bulleted list explaining project stages, such as "Initial Design and Permitting" and "Commissioning and Training," tailored to the specific hardware selected.

3. Advanced Data Engineering

The sheet leverages advanced Google Sheets functions to create a "Relational Database" feel:

- **VLOOKUP & XLOOKUP:** To bridge the gap between the **Dashboard**, **Quote Gen**, and **Costing** tabs.
- **AppScript (JavaScript) Automation:** A custom script was implemented for "One-Click PDF Generation." This script takes the data from the Quote Gen tab, populates a professional template, and generates a PDF stored directly in a specific Google Drive folder.

Key Features & Workflow

1. **Input:** Enter site-specific data (Site Name, Address, and Scope).
2. **Selection:** Choose hardware (e.g., Nexblue, Rolec) and groundworks from pre-populated dropdowns.
3. **Process:** Advanced formulas calculate "Project Total if funded by Client" and "Contractor Margins."
4. **Enhance:** Trigger Gemini to write the technical narrative based on the specific site parameters.
5. **Output:** Click a single button to generate a client-ready PDF quotation.

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Results

The implementation of the Quote Generator transformed the operational workflow:

- **Efficiency:** Quote turnaround time was reduced from hours to minutes.
- **Accuracy:** Eliminated manual calculation errors by grounding every quote in the master **Bill of Quantities**.
- **Professionalism:** Every client receives a standardized, high-quality document featuring AI-enhanced technical descriptions that previously required senior engineering input.

Conclusion

By combining the accessibility of Google Sheets with the power of JavaScript automation and Gemini AI, this tool has moved the quoting process from a manual task to a streamlined, scalable business asset. It demonstrates how "low-code" environments can solve complex industrial challenges when integrated with modern AI capabilities.