

Reducing Project Risk

WITH INTEGRATED DESIGN & CRITICAL CHAIN PROJECT MANAGEMENT

Keeping Projects On Track Is Harder Than Ever



THE PROBLEM

Equipment costs, resource constraints, and lead times are skyrocketing in every industry. Internationally, the average project pushes past its intended schedule by 43% and exceeds its original budget by up to 28%.



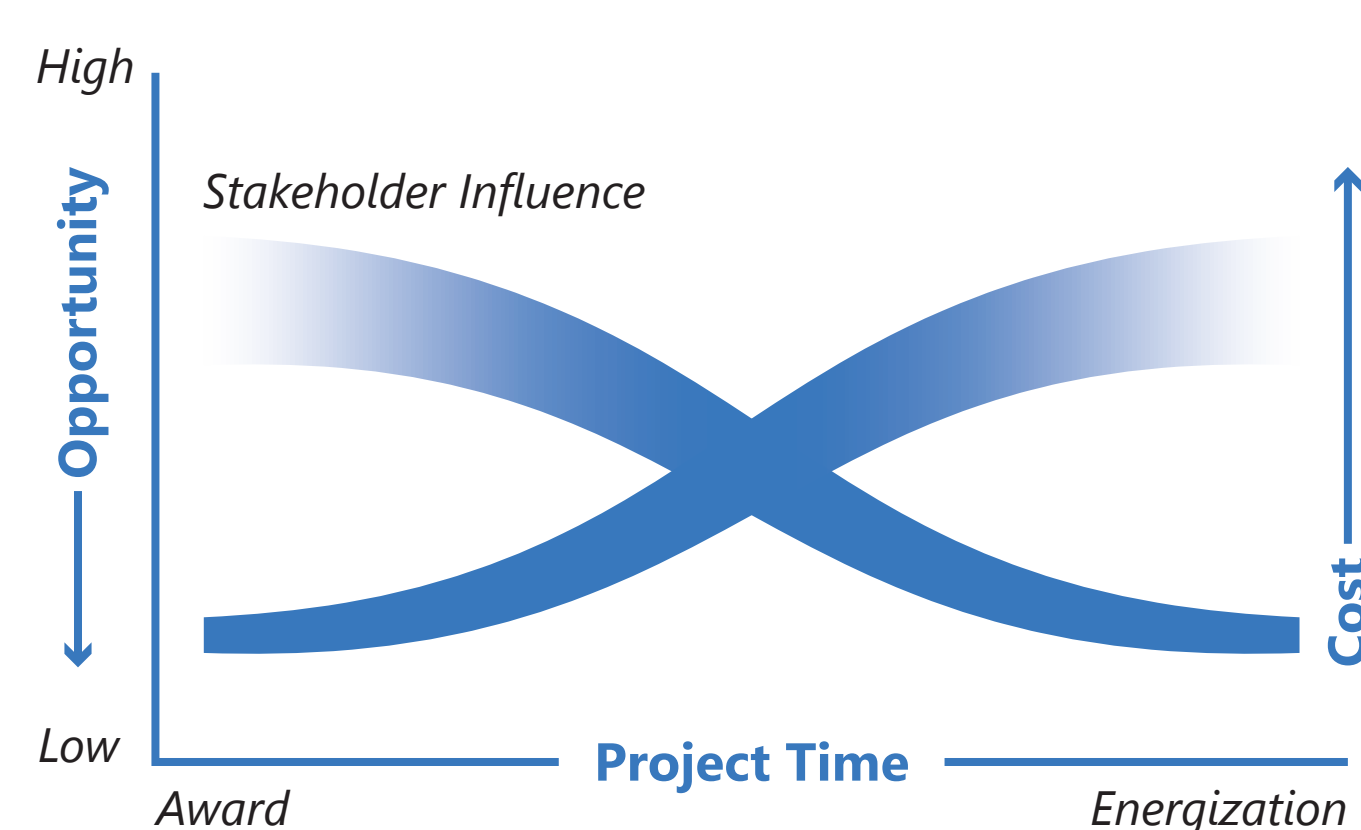
THE SOLUTION:

A combination of **commitment-based project management** and **4D modeling** that brings all stakeholders to the same table at the project outset. This enables timely resolutions to potential conflicts, as well as budget and schedule savings.

The Toolbox You Need

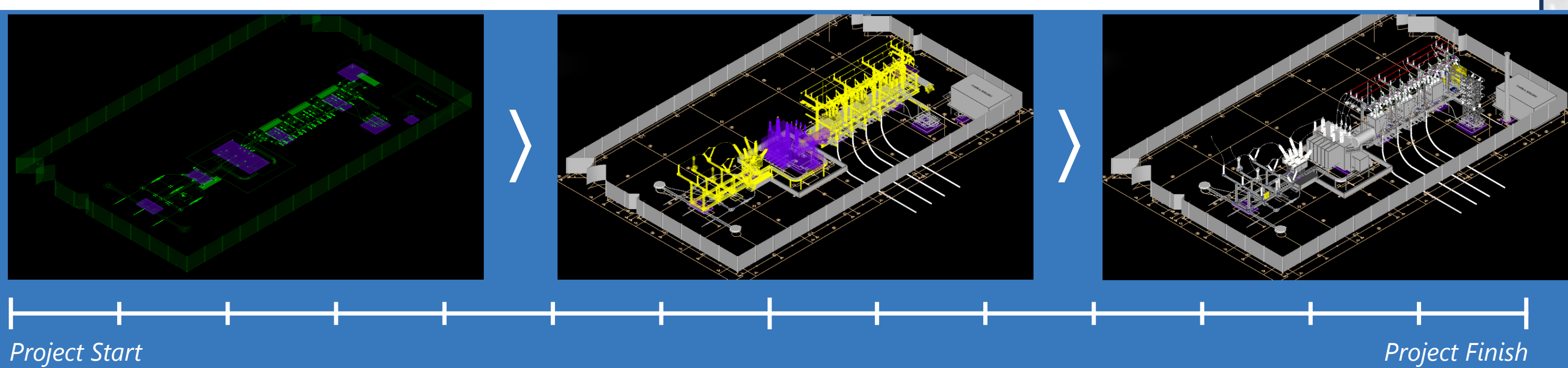


Integrated Design and Construction, also known as building information modeling (BIM), is a tool that combines 3D design with a project's timeline to create a 4D model that can be animated so stakeholders can simulate the construction process before it starts. This drives decision-making earlier in the project lifecycle to maximize the impact and minimize the cost of design and construction changes.



"Relying on 2D drawings accompanied by descriptive narratives leaves every project participant with a slightly different mental model that exists solely in their imaginations."

4D MODEL



Bringing It All Together

Individually, IDC and CCPM address some of the core challenges to successful project execution: lack of a common vision, unaccounted scope changes, and resource gaps or conflicts. When combined, IDC and CCPM create a single, credible source of all project schedules, obligations, scope, and designs. This methodology provides visualization of the project through its entire lifecycle (the 4D model).

BENEFITS

- ✓ Cost savings and schedule certainty
- ✓ High confidence schedules not reliant on assumptions or guesses
- ✓ Team coordination
- ✓ Accurate scopes and resource allocation

DEMONSTRATED RESULTS

Case studies of our high-voltage substation projects that used IDC and CCPM showed the following benefits:

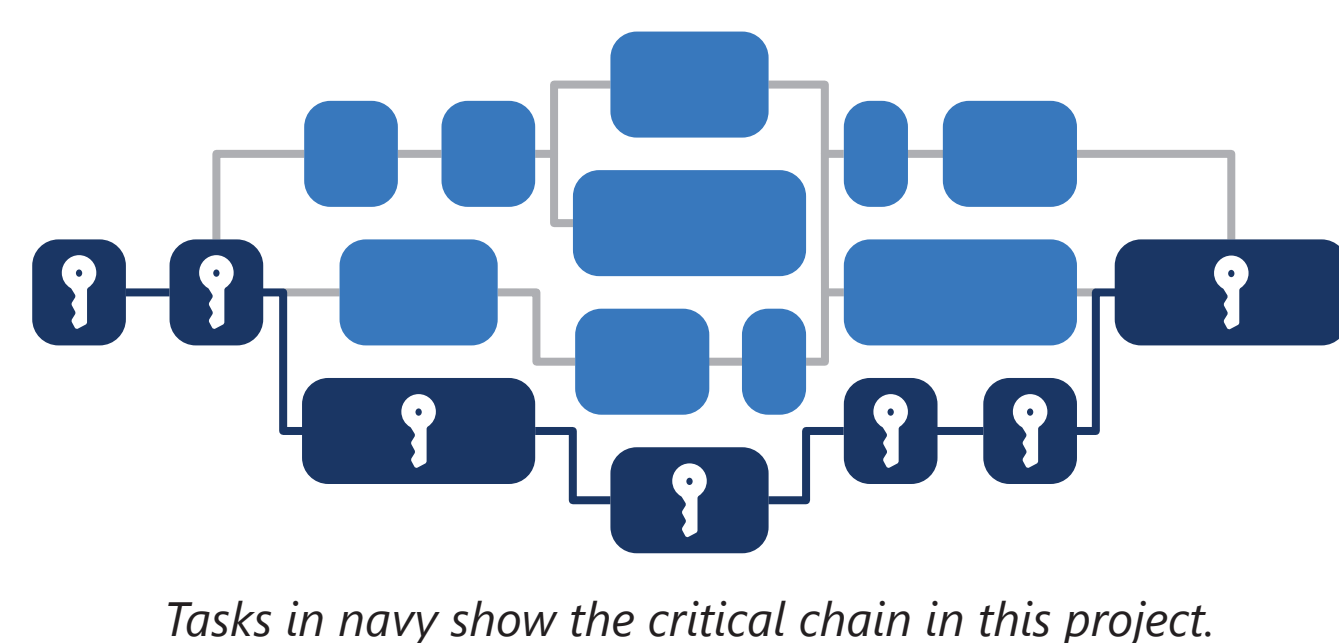
- 📄 **Direct cost savings.** *One project saw \$600,000+ in savings* thanks to a site footprint reduction. The 4D model helped reveal a site condition that would have required a costly workaround. The redesign instead reduced the site footprint, avoiding the site constraint and saving additional money on land.
- 📍 **Scope accuracy.** In another project, the 4D model revealed that medium-voltage terminators were not included in any of the contractors' scopes. The customer was able to assign the scope before the gap impacted budget or schedule.
- 🕒 **Schedule visibility.** IDC helped us show a customer the dramatic schedule difference between installing concrete foundations (six weeks) versus helical anchors (five days).

HOW IT WORKS:

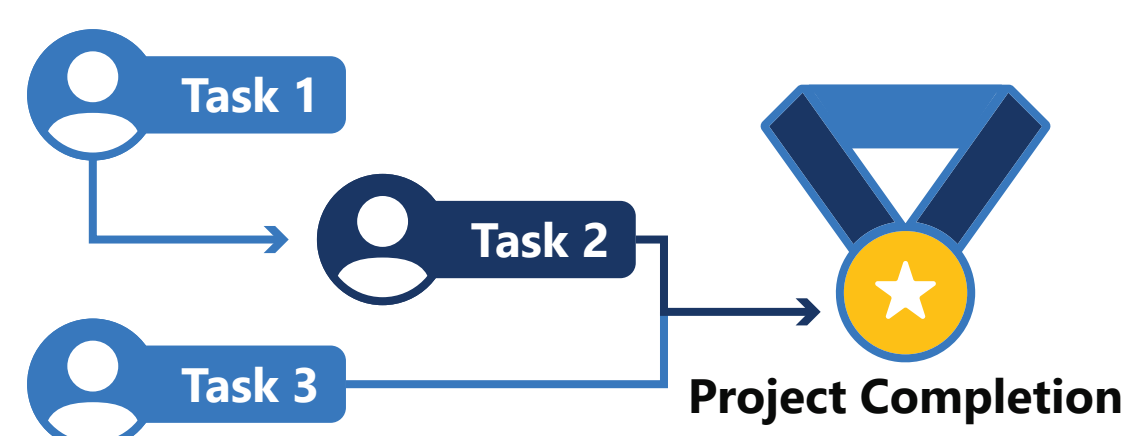
- ✓ Aggregate all project data in a single source.
- ✓ Create a visual representation of the project.
- ✓ Orchestrate resources to ensure they're on site when needed and use a 4D simulation to play through the project construction.
- ✓ Give all stakeholders equal access to the same information at the same time.
- ✓ Sequence the construction process step-by-step before starting to build.
- ✓ Ensure that you have the right resources (ex. people, equipment, and materials).

Critical Chain Project Management

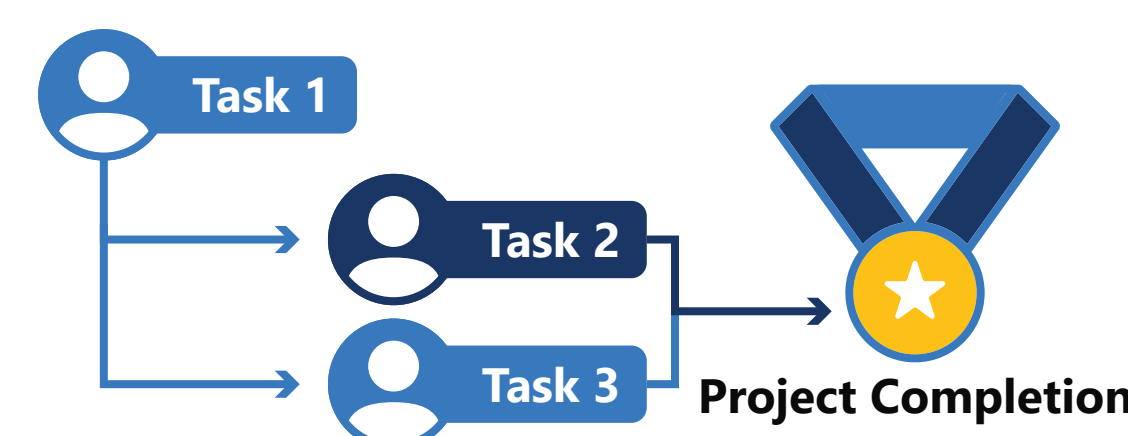
is a method of planning & managing projects that considers the tasks and resources required to complete a project. The critical chain is the longest path in the schedule that accounts for activity interdependence and resource constraints (see navy tasks on right).



How CCPM Addresses Resource Conflicts/Constraints



Without considering resource constraints, the person responsible for both light-blue tasks is unrealistically expected to divide focus between two tasks simultaneously.



Here, that person can focus on one task at a time with the understanding that multitasking would otherwise divide focus and likely degrade work on each task.

CCPM determines the total project duration based on the longest sequence of dependencies between tasks. That yields the chain of events needed to reach project completion.

HOW CCPM WORKS:

- 1 **Create a charter** of the tasks necessary for project completion and define each person's role and scope on the project, creating a relay race approach.
- 2 **Build a schedule** with commitments and resources.
- 3 **Aggregate the buffer.** Instead of using per-task deadlines where everyone includes extra time for tasks, CCPM aggregates all this "safety" time and adds it to the end of the critical path to establish the project completion date. The team can use this buffer for any tasks that take longer than expected.

Getting Started

- 📄 Gather Stakeholders
- 📍 Visualize Project With IDC
- 🕒 Execute Project With CCPM

Be more confident about your project's success with the tools to visualize your project from start to finish and ensure you have the staff and resources when you need them at every stage.

For more info, scan the QR code or visit www.betaengineering.com



White Paper



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