



Brown AND Caldwell

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Challenges and Successes of Implementing Project Controls on a \$1.7B project



Gary Dubin and Tyler Monson

2022

Gary Dubin:

- 30+ years experience
- Public and private capital construction (\$8B)
 - Gwinnett County
 - Lake Oswego
 - EchoWater
 - Sites Resevior
- Project & program cost controls, database design and administration, information technology strategic planning, data management optimization



Tyler Monson:

- 15+ years implementation experience
- Over 50 PMIS Implementation Projects
 - Apple
 - Disney
 - Stanford University
 - EchoWater
- 50 to 1000+ users
- PMP, Agile Certified Practitioner
- More than 100 clients in construction, government, utilities, education and entertainment

Agenda

- The Project
- Objectives
- Challenges
- Approach
- Lessons Learned
- Q&A

The Project

Regional San

- Sacramento, Ca
- 2,150 acres
- 14th largest wastewater treatment plant

EchoWater

- New Permit Requirements
- Programmatic Approach
- \$1.7B Cost
- 2012 -2024
- 22 Projects
- \$1M - \$500M+

ENTIRE ECHOWATER PROJECT



2.1 million cubic yards of soil excavated.

22 individual projects

form the EchoWater Project.

BIOLOGICAL NUTRIENT REMOVAL PROJECT



20 acres of land* covered by this massive project.

Roughly equal to

18 football fields!



3.2 million feet

of electrical wire and cable used.

Enough to stretch from Sacramento to Phoenix!



225,000 cubic yards

of concrete used in construction.

COMBINED PROJECTS

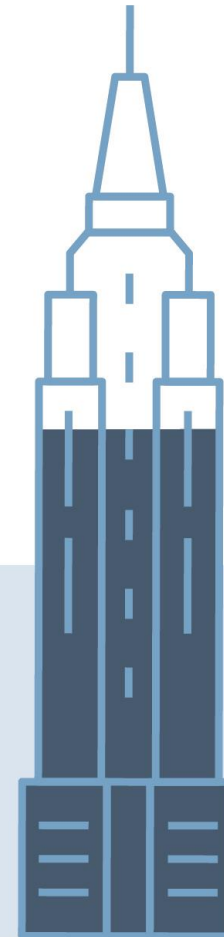
41,350 tons of steel*

used on the Biological Nutrient Removal, Tertiary Treatment Facilities, and Nitrifying Sidestream Treatment Projects.

69%
of steel framework

That's close to the **60,000 tons** used for the framework of the Empire State Building.

* These values are approximations.



FLOW EQUALIZATION PROJECT

83,500 cubic yards

of concrete used in construction.

That's enough to fill



22 Olympic swimming pools



Objectives

- Consistent but Flexible
- Transparency
- Prepared for Audit/Claim
- Cost Effective
- Responsive
- Seamless Handover to Operations

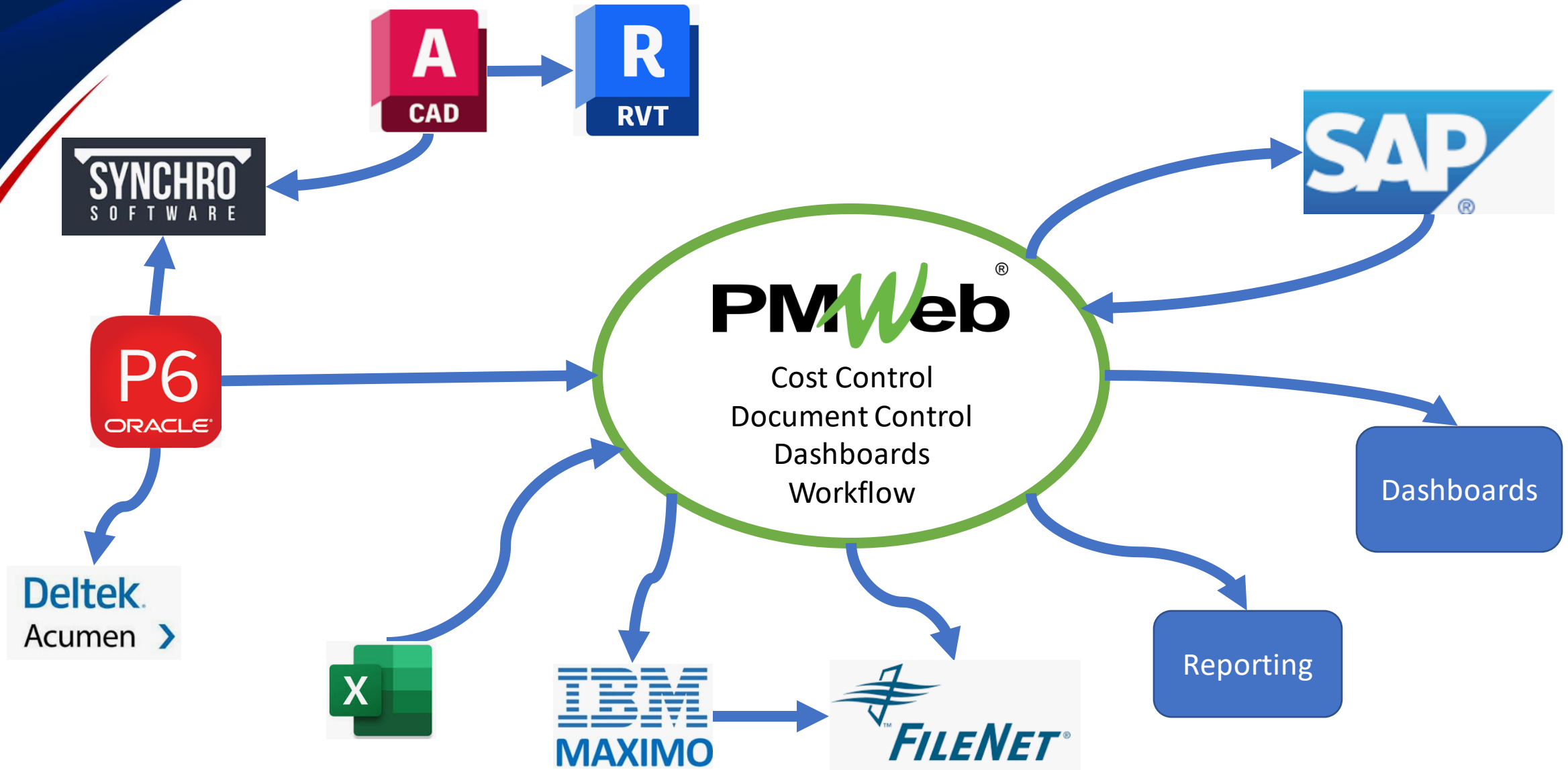
- Schedule Constraints
- Brand New PMO = Shifting Requirements
 - FastStart
 - Funding Requirements (SRF)
 - Processes still being defined
 - Many unknowns (projects, people, processes)
- Organizational Change
 - Some Disinterested Parties
 - Wide Range of User Abilities
 - SMEs not available (too early in program)
- No single point person for detail decisions

Approach

- Best of Breed
- Deploy in Phases
- Agile Implementation
- Include All Stakeholders
- Right Sized Solution
- Flexible Robust Reports

Approach

Best of Breed





Planning

Budgets

- Meeting Minutes
- Risk Management
- Document Manager
- Invoices
- Financial Integration**
- PM Standards

Design

- Design Submittals
- Contracts
- Bid Management
- Synchro (BIM 5D)**
- Access Requests
- Roll Call
- Drawing Management

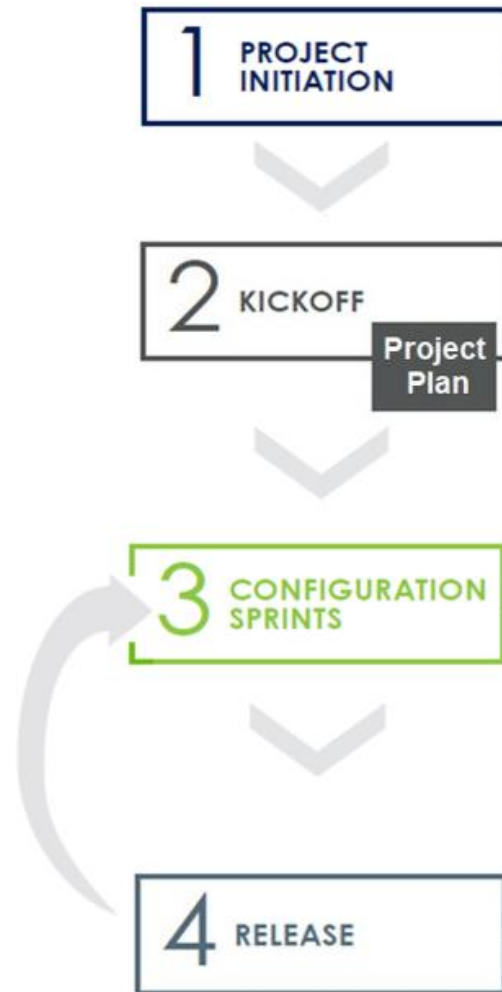
Construction

- RFIs
- Submittals**
- Change Management
- Inspector Dailies**
- Punchlists
- Schedules (Monthly, TIA, Recovery)
- SWPPP
- Buy American
- Project Photos

Commissioning

- Test Forms
- Commissioning Reports
- FileNet Integration
- CMMS Integration (Maximo)**

Agile Implementation



- **Configuration**

- Iteratively gathered requirements and configured one piece at a time
- Embedded JV partners
 - Onsite Administrator/Support
 - Onsite Report Developer
 - Onsite Construction Support lead

- **Training**

- Just-in-Time Training
- Dedicated Training Location
- Tips and Salsa
- Extensive Online Help Guide

Include All Stakeholders

- Expanded from original intent to have 20 internal users
- Heavy Utilization of Workflow Engine
- Include System usage in contract language
- Owner paid for all licensing
- All invoices submitted by each party through system and ended at Finance
- Self Service Approach



- Balanced use of Document Manager vs. Records
- Flexible Integration Approach
 - SAP - Manual
 - FileNet - Automated
 - Maximo - Automated
 - P6 - Hybrid
- Small vs. Large project adjustments



Flexible and Robust Reports

- Fewer but more powerful
- Dashboards
- Navigational - drilldown to the data entry
- Tailored to each group
- Connected reporting

The screenshot displays a comprehensive project management dashboard. On the left, a navigation pane includes sections for 'Dashboard Selection', 'Project Selection (Construction Jobs)', and 'Reports Selection'. The main area is divided into several key components:

- Construction Documents:** A table showing document status across different phases: Draft, <=7, >7, Both, Done, Rejects, and Total.
- % Budget Spent by Phase:** A horizontal bar chart showing budget allocation for Planning, Design, Bid and Award, Construction, Commissioning, Closeout, and District Costs.
- Construction \$ History (in million):** A line and area chart showing historical spending from 2014 to 2022.
- Cost Projections:** A line chart showing projected costs from 2014 to 2022.
- Potential Change Pricing Summary:** A summary table for selected projects, including a bar chart comparing Budgeted (2.5%) and Approved CCOs (2.4%) changes.
- Construction Allowance Summary:** A detailed table showing allowance details for various projects and cost codes.
- Budget Summary:** A table comparing Budgeted, Authorized, Spent to Date, and Remaining amounts.

Construction Documents Table:

Category	Draft	<=7	>7	Both	Done	Rejects	Total
Submittals - General	16	0	2	=	102	45	165
Submittals - Equipment	46	1	1	=	1063	735	1846
Submittals - O&M	4	0	0	=	64	28	96

Potential Change Pricing Summary Table:

Contingency	\$	Contract Summary	Days
Original	296,576,808.00	Original	0
Approved CCOs ¹	7,515,626.60	Approved CCOs ¹	13
Allowance	2,700,000.00	Allowance	
306,792,434.60	Current Contract	13	
Exposure (144 Active PCs) ²	3,797,950.31	Exposure (144 Active PCs) ²	0
\$310,590,384.91	Forecast	13	

Construction Allowance Summary Table:

Project	Cost Code	Description	\$ Original Value	\$ Released	\$ Remaining	\$ Total Spent	% Spent
TTF	4-A2	BID02 Allowance - Unforeseen Site Conditions	1,000,000	942,623	57,377	884,015	88%
TTF	4-A3	BID03 Allowance - Unanticipated Utility Conflicts	500,000	294,857	205,143	296,343	59%
TTF	4-A4	BID04 Allowance - Test, Mod, Rehab (E) Facilities	900,000	900,000	0	900,000	100%
TTF	4-A5	BID05 Allowance - Site Maintenance for Contractor Common Areas	100,000	103,181	(3,181)	100,000	100%
TTF	4-A6	BID06 Allowance - Backfill Soil Treatment on Critical Path	200,000	74,949	125,051	74,949	37%
Total			2,700,000	2,315,611	384,389	2,255,307	84%

Budget Summary Table:

Budget	Spent to Date	Remaining	Const. Budget
417.9	351.5	66.3	311.2

Authorized Budget Summary Table:

Authorized	\$ Authorized	\$ Spent to Date	Remaining
0	449,134	449,134	0
0	449,134	449,134	0
0	24,357,175	24,357,175	0
0	139,859	139,859	0
0	5,956,466	5,956,466	0
0	3,753,298	3,753,298	0
0	8,046,300	8,046,300	0
0	6,461,252	6,461,252	0

Lessons Learned

- Good integrations require continuous data monitoring and cleansing
- Embed data cleansing into the processes as much as possible
- Use and value in indexing assets from the submittals (handover to operations)
- Include system usage requirements in the specifications and contracts
- **Workflow**
 - Enabled Better QC
 - Streamline - Only do as many steps as is necessary
 - Be as consistent as possible
 - Key Processes were standard (cost related reviews) while others could be adjusted per project
 - Reporting to show where things are stuck
 - Steps to signal completion of external tasks
- Deployment of a Digital Adoption Platform like **WalkMe**

Success!

Production Statistics

- 13,500 Construction Submittals
- 7,500 RFIs
- 26,000 Daily Reports (38,000 Total)
- Every invoice processed in the system (1,200)
- Usage peaked at 500 logins per day
- 960 Users during life of the project
- 80+ Processes

- **Seamless Handover to Operations**
 - 18,000 Documents indexed and migrated to FileNet
 - Saved operations many years and people
- **Passed all internal audits**
- **Improved Claims Responses**
- **On Time and Under Budget**



Q&A



THANK YOU