Enabling Green Construction with Wrench-Enterprise

1. Introduction

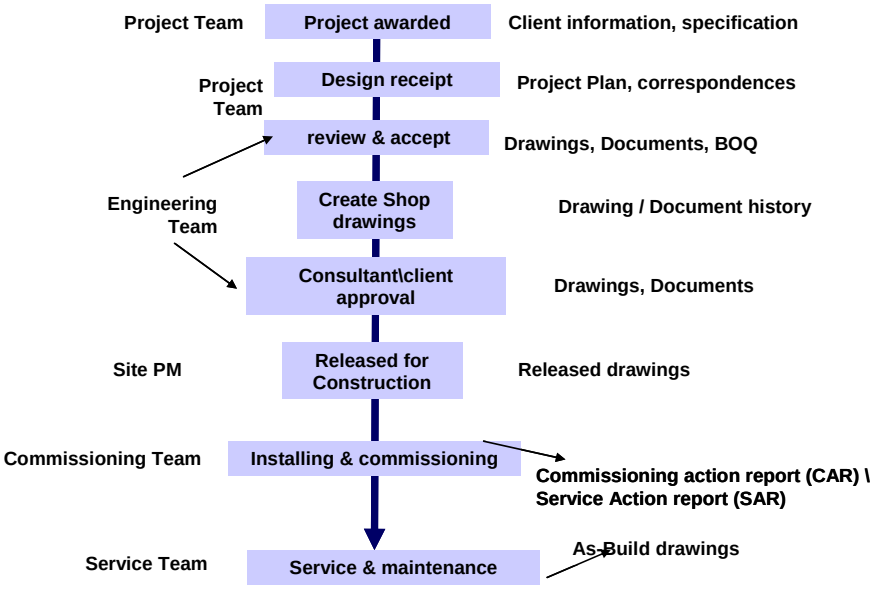
In the typical construction project, profits are lost mainly to inefficiencies, delays and rework, which are the result of a manually-managed working culture. The major bottleneck is in document management and resource monitoring, with the high percentage of human error and rework (that occurs as data flows between teams) being compounded by the effort-driven methods of monitoring and review.

2. The Project Process

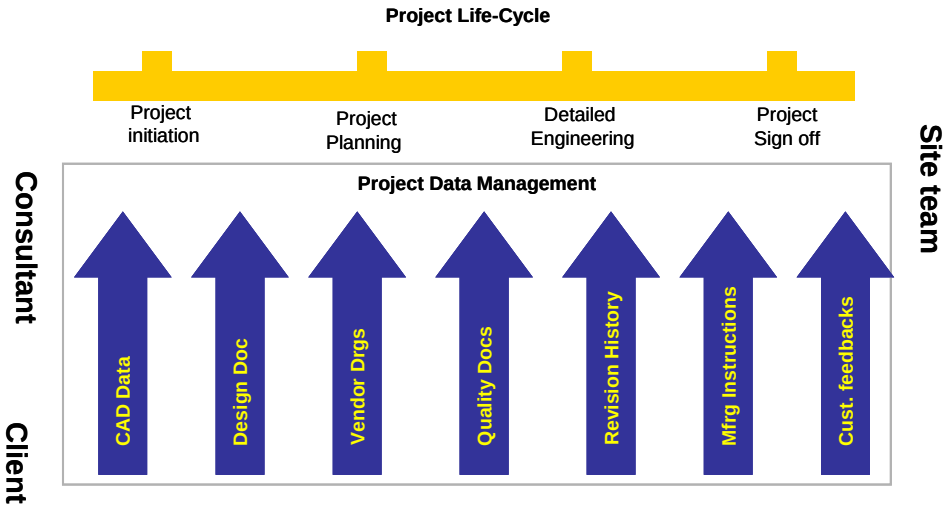
Today's global project lifecycle is a complex and interdependent mix of resources, workflows, data, procedures, standards, and deliverables. The need of the hour is to plan, execute and monitor projects across multiple locations more efficiently and with minimum wastage of energy, resources, time, or effort.

2.1 Project Snapshot 1 - Process vs. Documentation

Overview of resources, Project phase, and documents involved.



2.2 Project Snapshot 2 - Documentation vs. Lifecycle



3. Sources of Carbon in an EPC project

A construction project generates anywhere from 80,000 to 100,000 documents, most of which are printed out for convenience and secure storage. This includes hard copy documents like technical drawings, reports, and correspondence. (The bulk of documentation, around 80%, is correspondence i.e. emails/email conversations, letters, memos, proposals, couriers, etc. most of which are printed out and filed.)

Paper usage apart, engineering companies increase their carbon output by extensive travel across project locations (for project monitoring, review, collaboration and inspection)

3.1 Project Document Map

WHO	PROJECT PHASE	PROCESS	TYPE OF DOCUMENTS	AVG. No. (A4 equivalent)
Design Consultant	Conceptualization			
		Drafting	Drawings	90000
		Departmental Checki	Specifications	50000
		Interdepartmental Ch	comments, revisions, Correspondences,	70000
		Approval	comments, revisions, Correspondences,	100000
Client	Tendering			
		Tender Raised	Tender documents	50000
		Bids Received	Proposals	30000
		Technical Evaluation	Clarifications, revisions, purchase order, chall correspondences	60000
		Commercial Evaluatio	Clarifications, revisions, purchase order, chall correspondences	40000
EPC Contract	Contract			
		Drafting	Schedules, status reports, drawings, tend revisions, checklists, comments, minutes of and correspondences, Transmittals & Register	180000

		Department Checking	revisions, checklists, comments, minutes of and correspondences	60000
		Inter Departmental Cl	revisions, checklists, comments, minutes of and correspondences	50000
		Approval	revisions, checklists, comments, minutes of and correspondences	100000
		Tender Raised	drawings, tender specs, revisions	100000
		Bids Received	drawings, tender specs, revisions	100000
		Technical Evaluation	drawings, tender specs, revisions	60000
		Commercial Evaluatio	drawings, tender specs, revisions	60000
		Documents to Site	Work instructions, shop drawings, safety in checklist, schedules, reports, RFI's, submittals	100000
		Change Request	RFI's, submittals	50000
		Commissioning	Checklists, Work instructions, punchlist, approv	200000
		Hand Over	As-build, Handover documents, Quality checkli	100000

3.2 Project Travel/Transportation Map

Today's average construction/engineering organization is global i.e. it concurrently runs multiple projects across multiple locations. Along with the current trend of outsourcing some deliverables like design, this has created a situation where team members working on the same project are scattered over different locations and time zones. This not only makes it difficult to function as a single cohesive team, but also adds hugely to costs from traveling.

WHO	PROJECT PHASE	PROCESS	POSSIBILITY TRANSPORTATION	NEED TO TRAVEL
Design Consultant	Conceptu Alization		100	Discussion with Client and Contractor, approval.
Client	Tendering		30	Vendor meetings, clarifications, N Delivery, Acceptance.
EPC Contractor	Contract		500	Schedule finalization and review, Maj approvals.
		Construction		Construction review, progress review
		Change Request		
		Commissioning		Approval, acceptance, Clarifications
		Hand Over		Acceptance, Clarifications

4. The 'Green' Strategy: how technology can help construction project companies reduce carbon.

Technology can empower engineering companies to plan and execute greener projects by using 'lean construction' principles (translated from 'lean manufacturing' to the construction project process.) The objective is to eliminate or reduce the bulk of project waste (waste of resources, time, effort) and make existing methodologies more efficient.

Adopting the right kind of technology can transform the construction project lifecycle into a minimum-cost, maximum-value process and make engineering organizations both more environment-friendly and more profitable. The 'lean construction' approach is based on:

- Centralised, digitized, system-driven Data management
- Automated, system-driven Quality Enforcement
- Do-it-right the first time working culture i.e. no redundancies or unnecessary rework.
- Real-time, online project management and monitoring
- Optimization of project workflows into a single integrated, automated process
- Integration of other technologies and systems in use for more ROI
- Reusing of past project data and recycling of company's intellectual property.

5. WRENCH: The proven way to reduce carbon footprint in EPC projects

WRENCH is a proven technology for implementing 'lean construction' principles across the project lifecycle. By using WRENCH as their working platform, companies can reduce their carbon footprint significantly in a very short time and across the entire organization.

Studies conducted across companies like Ch2MHill VECO, Simon carves, Vatech Wabag, Habtoor Leighton group show that using WRENCH results in 30% more productivity, 60% faster design cycle, and 80% less paper usage.

WRENCH offers functionality like:

- Electronic document management. All project data is digitized, updated, shared, stored and communicated online on a web-based enterprise-wide platform. Apart from the huge savings in paper, this also means no more accidental use of obsolete data or old file versions, no slow FTP-based file transfers, no time wasted on routine file-naming and archiving tasks. Documentation handled includes technical drawings, project monitoring reports, To Do lists for each resource, minutes of meetings, design checklists, BOMs, vendor documentation, commissioning checklists, and of course, all project-related correspondence.

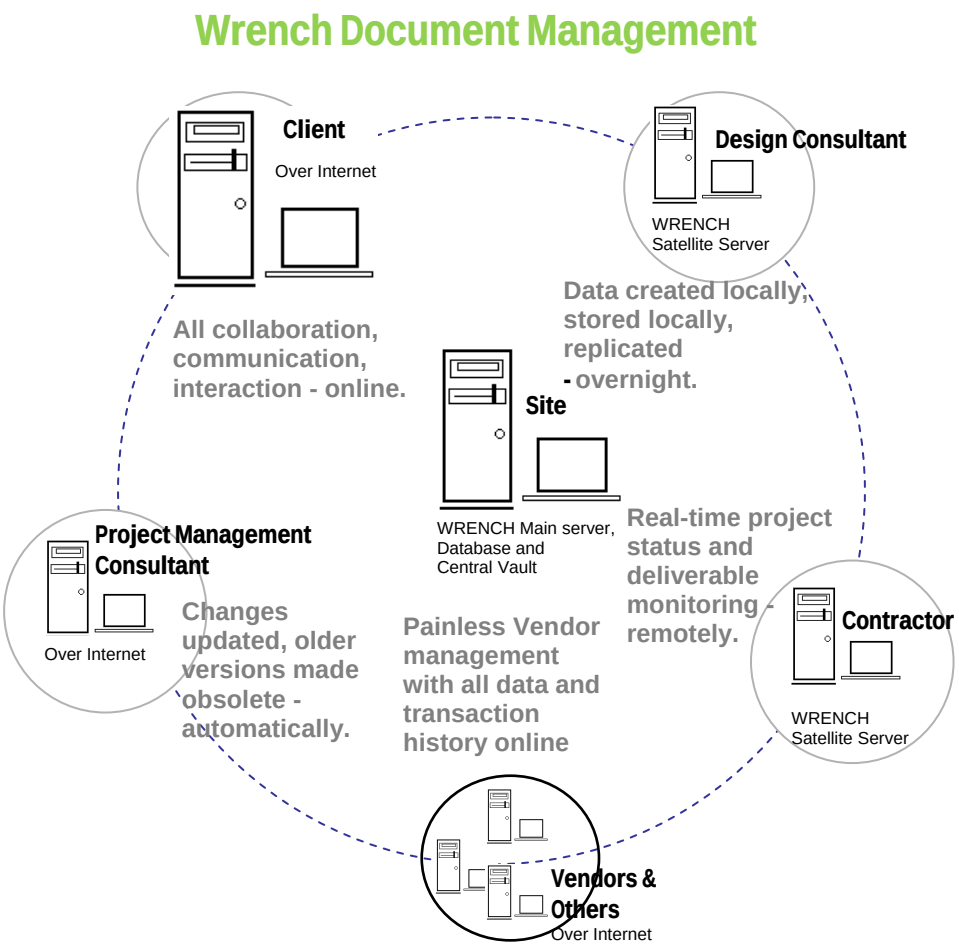
- Online collaboration (Redlining, markups, comment files). This includes automated, centralized, digitized interaction between all project shareholders – client, consultants, project teams, vendors, contractors etc. All interaction between project shareholders and communication is done online and the resulting correspondences i.e. Client approval, interaction and approval of vendor documents etc. are all done within the web-based system.

- Automated Workflows which are maintained online (documents are routed via the Web). ISO/Quality procedures are enforced automatically and driven forward by a system rather than human managers.

- 80% reduction in travel thanks to the collaborative tools in Wrench, such as online viewing, redlining, markups, integration with web conferencing tools (voice based integration), online multi disciplinary checking, online web collaboration on drawing.

- Realtime monitoring of project progress – managers can assess work status from their desktops with a few clicks. This includes online monitoring of commissioning activities.

5.1 How Wrench manages Drawings & Documents electronically and minimizes travel



5.2 How Wrench manages project correspondence electronically (Correspondence amounts to 80% of project data)

Types of Correspondence	Email %	Letter %	Fax %
RFI	80	15	5
RFQ	80	15	5
RF Inspection	80	15	5
Clarifications	80	15	5
Memos, General Mail and Others	80	15	5

In WRENCH:

- Letters are sent or received through MS Outlook, but reviewed and vetted through Wrench and all communication threads are captured. Notifications are sent to intended resources preventing photo copying of hard copies.
- Letters are routed through the system-driven online workflow for review.
- Online Archival of all project related correspondences along with audit trail.
- Hard copy document received are digitized and sent for review through Wrench.
- Over 90% of project correspondence is handled electronically within Wrench.

6. Summary

In an age where global project companies need to plan, execute and monitor projects across multiple locations more efficiently and with minimum wastage of energy, resources, time, or effort, WRENCH fulfils this need by integrating data, users, software, processes and methodologies into a harmonious whole.

WRENCH is the world's only PROVEN technology built specifically to empower engineering organizations to function profitably across locations and time zones without harming the environment they function in.

To learn more, visit www.wrenchepc.com
or mail us to wrenchinfo@wrenchsolutions.com
