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Technology, cost data, and services supporting the efficient renovation, repair, & sustainability of the built environment - buildings, transportation, utilities.

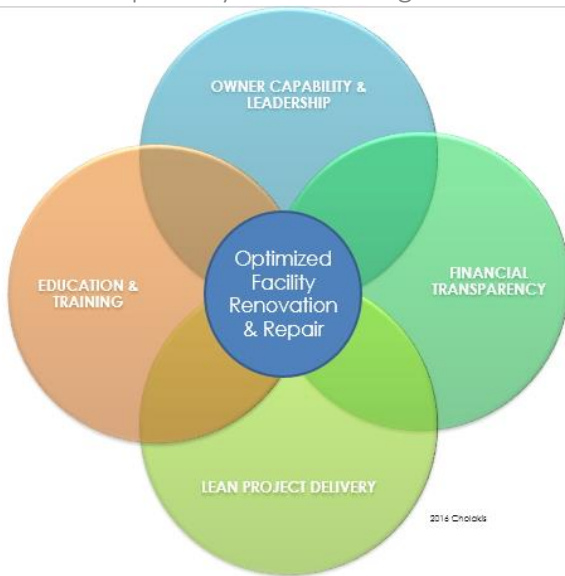


Why BIM Will Not Succeed

Lack of Competency in LEAN Integrated Construction Project Delivery

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Introduction

All forms of construction, renovation, repair, maintenance, sustainability, and new, require all a level of interdependence and information sharing in order to fully understand needs, requirements, limitations, desired outcomes, and overall best value.

The Architecture, Engineering, Construction, Operations, and Owner sector (AECOO) as a whole largely acts in an adversarial manner, thus there is no real confusion as to why productivity and waste remain unchecked.

The only way to initiate and maintain positive change is to adopt a collaborative partnership model based upon sharing information and resources among all participants and stakeholders.

While technology can certainly support such a process and enable lower cost and more consistent deployment, it can't effect change and can't be the sole focus. Thus, the primary reason BIM has not, and will not succeed is the current focus upon technology versus best value business practices and processes.

Leadership

Changing from adversarial business models such as design-bid-build, low-bid, and even more recent attempt at improvement such as CM@R and design-bid requires competent leadership. Real property owners are ultimately responsible for the built environment, and thus hold the responsibility for current issue with rampant waster and low productivity. While in today's world, accepting responsibility is no long in vogue, this sole fact still remains.

Note that the term "competent" leadership was used. Competency in life-cycle physical asset modeling and management and/or total cost of ownership asset modeling and management is needed in order to lead progressive AECOO change.

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Successful leadership and associated change management involves providing guidance, oversight, and positive direction in support of mutually desired outcomes versus excessive management and control and exclusive focus upon self-interest.

Physical Asset Total Cost of Ownership / Life-cycle Modeling and Management

The process of optimizing the life-cycle of physical assets involves multiple competencies, processes, and technologies. While an Owner need not be an expert in all, they must have a general understand of core concepts and manage the overall framework in concert with the specific needs of their organization.

The core aspects of Physical Asset Life-cycle Modeling and Management are shown below, and unfortunately not taught as a whole via formal education nor most professional education programs. Until this changes, the widespread use of BIM will not occur. [Learn more about this section.](#)



INDUSTRIES¹ Competencies²

¹Industries - Business areas supporting specialized asset management business processes and practices.

²Competencies - Core skills and activities performed within specified asset management industries.



Project Delivery Management

Project delivery management is the least understood of all the “Industries” noted above, and the area where the greatest value can be recognized from focused education and training.

Collaboration is a term used heavily, and it can easily be taught, or more important, it can be mandated. Many of the fundamentals of collaboration have been successfully implemented in other industries. The most widely known being the Toyota Production System (TPS) and various forms of LEAN manufacturing. The billions of dollars of waste due to loss of productivity, excessive administration, legal disputes, and miscommunication could be mitigated through the implementation of LEAN collaborative construction delivery methods.

LEAN Collaborative Construction Delivery

LEAN construction collaborative delivery is not new. The most widely known implementations, Integrated Project Delivery, IPD, for major new construction, and Job Order Contracting, JOC, for renovation, repair, maintenance, sustainability, and minor new construction, have both been practiced for over two decades.

The issue is that few Real Property Owners fully understand the core concepts and required implementation aspects of either IPD or JOC, or LEAN collaborative construction delivery in general. In fact, many of the Owners that current implement JOC, for example, do so only to circumvent their procurement process, and approve construction projects that normally would not be approved.

Job Order Contracting

To better understand collaborative construction delivery, let’s take a better look at Job Order Contracting, JOC.

The United States Department of the Army initially developed and deployed what would later become Job Order Contracting, during the early 1980s. It did so in response to a growing need for increasing and unsupportable demands for construction throughout Europe. Traditional design-bid-build (DBB) construction delivery was too inefficient for the large numbers of renovation, repair, and sustainment/maintenance projects. Associated delays were negatively impacting the Army's mission. The new method was designed to shorten procurement and overall project delivery times while also maintaining quality.

Since the initial European implementations, JOC was further developed and validated by the U.S. Department of Defense: West Point Academy in 1985, and multiple United States Air Force bases in 1986. The United States Air Force (USAF) has since gone on to become one of the largest, and perhaps most refined, user of Job Order Contracting to this day. Job Order Contracting goes under the name of SABER at USAF bases throughout the world.

Research, surveys, and case studies jointly validate the benefits of Job Order Contracts and/or Job Order Contracting versus traditional construction delivery methods. Though all highlight that JOC Programs must

be implemented properly: in an objective, transparent manner, and based upon LEAN best management practices and managed by competent Owners.¹

Annual performance research studies have been performed by various groups, including Arizona State University and the Center for Job Order Contracting Excellence - CJE, between 1994 and 1998, and most recently in 2015. The 2015 JOC Performance Survey noted that 95% of Real Property Owners were satisfied with Job Order Contracting and 85% clearly indicated its benefits versus other methods.

In addition, multiple independent Audits of Job Order Contracts have been performed by Federal, County, State, and Local Governments. [Learn more about this section.](#)



The Future Path to a Productive AECOO Sector

- Collaborative Construction Delivery Requires Culture Change and Culture Change Takes WORK
- Collaboration Can Be Learned
- Owners MUST demonstrate LEADERSHIP and COMPETENCY

¹ Note: The use of a third party to administer Job Order Contract has also evolved. This practice, while not as efficient as direct Owner management and direct Owner participation does provide a way for real property owners to become exposed to JOC. This method of deployment includes consultants and cooperatives. In any third party administration of a Job Order Contract, it is important that the service provider not have the authority to approve a Job Order / JOC Project while also being paid a percentage of the overall JOC construction volume. This practice has been noted in JOC audits as creating a potential for misuse and/or fraud.

- A Clear Chain of Command must be present , leadership must be present without Excessive Management and Control
- Be Clear on Objective(s) and desired Outcomes
- Have A Joint Owner / Consultant /Contractor / AE / Building User Advisory Team
- Get Stakeholders to Your ALL Partnering Workshops
- Make Partnering a Top Performance Objective for Senior, Middle Management, and Staff
- Make Leadership and Change Management a PRIORITY
- Integrate Partnering Into a Dispute Resolution System
- Making Collaboration & Partnering Mandatory
- Develop a Clear Framework for Your Partnering Program
- Incorporate the Partnering Program into the Contract, Operation/Execution Manuals, Marketing, etc.
- Offer Initial and Ongoing Training in How to Implement the Program (IPD, JOC...) and Partnering Skills
- Continuously Work to Align Internal and External Organizational Units
- Develop and Understand that Collaborative Construction Delivery is LONG TERM RELATIONSHIP and COMMITMENT
- Identify Policies and Practices that Don't Support Collaboration and Eliminate Accordingly
- Use Your Facilitators to Help Implement Your LEAN Collaborative Construction Delivery Program
- Capture Lessons Learned and Use Them to Take Your Next Collaborative Construction Delivery Program to the Next Level
- Understand That You Can't Just Hold a Partnering Workshop
- Develop and Monitor Key Performance Metrics, KPIs, What Gets Measured Improves



- Share Rewards and Risks
- Base Rewards Upon Performance
- Drive Decision Making Down to the Project Level and Encourage Comments/Suggestions
- Don't Let Project Issues Sit Remain Idle, Use The Dispute Resolution Processes
- Weekly Meetings and Site Visits Are an Important Part of Your Partnering Effort
- Hold a Lessons Learned Workshop at Close Out
- LEAN Collaborative Construction Programs and Projects Succeed When The TEAM Commits to Success

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LEAN Construction Delivery Methods drive continuous improvement through the acknowledgement and leverage of interdependence and team expertise on both global and local levels. The levels of cooperation of all stakeholders are well defined and mandated in order to achieve individual and team benefits.

While the new wave of technologies can support collaborative LEAN construction delivery methods and associated improvements in productivity and quality, they are not “the answer”. This is the primary reason BIM is failing. Focus has been upon technology, versus simply how to get more construction projects done on-time, on-budget, and to the satisfaction of everyone involved.

References:

JOB ORDER CONTRACTING: A PROCUREMENT SUCCESS STORY, Report AR713R1 February 1988

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White Papers:

The History of Job Order Contracting – [The LEAN Construction Delivery Method](#)

JOB ORDER CONTRACTING – Overview & Best Management Practices – [Job Order Contracting White Paper 2016801](#)

COLLABORATION IN CONSTRUCTION – IPD, JOC – [Collaboration in Construction-White Paper](#)

INTEGRATED PROJECT DELIVERY – for Public and Private Owners – [Integrated Project Delivery for Owners](#)

Asset Life-Cycle Model - [Total Cost of Ownership Management](#)