



BLD126646

Connecting the Dots to Deliver High-Performing Buildings

John Wiegand
Senior Implementation Consultant
Autodesk

Ken Stowe
Construction Manager
Autodesk

Dean Reed
DPR Construction

Learning Objectives

- Discuss and understand the value of creating an environment of performance
- Discuss and understand how lean and BIM support performance management
- Discuss and understand integrated information workflows
- Discuss and understand measuring success of high-performing teams

Description

This panel discussion will explore opportunities to manage construction execution by creating a performance-based strategy to align project performance with anticipated outcomes, thus creating the high-performing building. Using principles such as the simple framework as found in Integrating Project Delivery (Fischer, Ashcraft, Reed, Khanzode), production planning methods, lean principles, and integrated design, the discussion will explain strategy, practice, and the vision of future state. The panel will provide insight into the theory and opportunities for improving performance. Once the framework has been agreed upon, teams can operate a performance management system by defining the performance criteria and validating performance through data collection for specific and measurable metrics. There will be system alignment throughout the project lifecycle in a collaborative environment to provide transparent and powerful information to the team for optimized performance

Your AU Experts

John Wiegand is a Senior Consultant for AEC at Autodesk and brings 34 years of construction field experience to provide construction professionals with solutions to process alignment issues in project execution. John has served in many roles for successful construction execution including Superintendent, General Superintendent and operations leader. John has been a Lean practitioner since the early 2000's with a vast experience in production management, Lean principles, process alignment and fundamentals of team dynamics. Article Author; "Six critical factors for Lean project success" (ENR November2016); "11 Safety tips for using technology in construction" (Construction Dive Magazine October2015)



Kenneth H. Stowe, P. E. is a construction technology expert and development strategist at Autodesk, Inc. With 25 years of experience in construction management and project control on projects as large as \$1.4 Billion, eleven years in BIM software, experience on four continents, numerous articles, and contributions to four books, Stowe leads a team at Autodesk responsible for construction business development and strategy initiatives worldwide. With unshakeable conviction in the benefits of BIM and teamwork, Stowe and his team create a unique partnership between Autodesk's product development and industry leaders in the worldwide construction community. For many construction professionals in the U.S., Canada, UK, China, Sweden, Australia, Malaysia, Singapore, France, and other countries, Stowe is a trusted advisor as they invest in tools, process improvements, and metrics to improve and measure total project team performance over the facility lifecycle.

Dean Reed is an advocate, organizer and educator for Lean and Integrated Project Delivery at DPR Construction. Dean became an early advocate for both Virtual Design & Construction and Lean Construction after seeing the value of 4-D simulations and the Last Planner System in 1997. Dean's focus is sharing his experience and insights with owners and projects teams using Integrated Project Delivery and Lean practices to design and build high performance buildings. He is a co-author of the book, Integrating Project Delivery, by John Wiley & Sons.

Brief Introduction to the Simple Framework

This is a very brief introduction to the big idea of the book I co-authored with Professor Martin Fischer of Stanford, Howard Ashcraft of Hanson Bridgett LLP, and Atul Khanzode, also with DPR Construction. That idea is the only way to predictably plan, design and construct high-performing buildings is through aligning and integrating the knowledge, efforts and information of the companies and individuals chosen to deliver them. "What? it can't be that simple," you say. Yes, it is. I'll explain in words and pictures in the following paragraphs.

Economics & Value

Value is simply quality divided by cost / price. Great quality and lower cost is high value. Low quality and high cost is low value. Figure 1 shows what the grocery chain, Trader Joe's thinks. Every customer in every market wants high value. Quality is the right building built right the first time with no one injured while the community and environment are respected and sustained. Whole life value for a building comes from all systems being highly integrated, well built and designed for the best possible use, facility operation, and financial outcomes for the customer's enterprise. Figure 2 shows economics of value, made greater or smaller by business planning, design and construction, i.e., project delivery

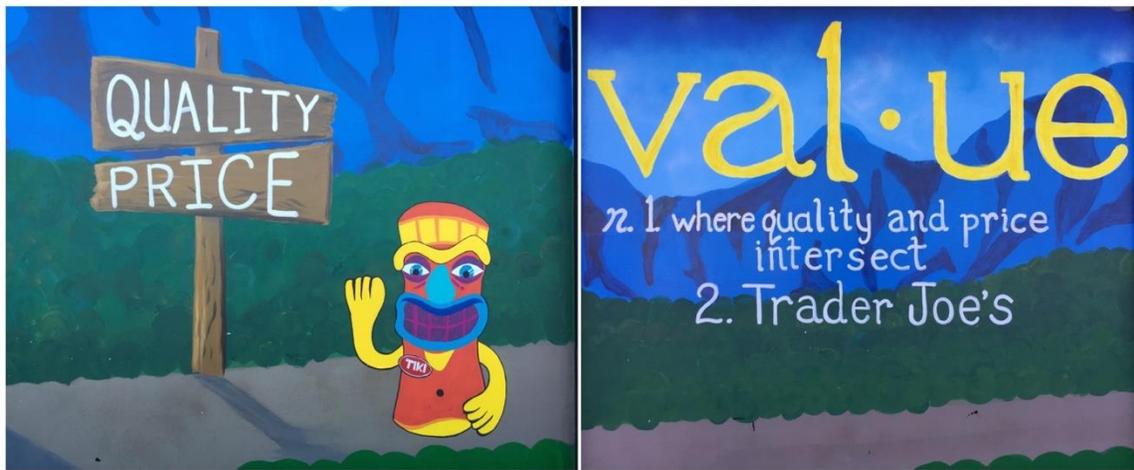


FIGURE 1: VALUE SIMPLIFIED

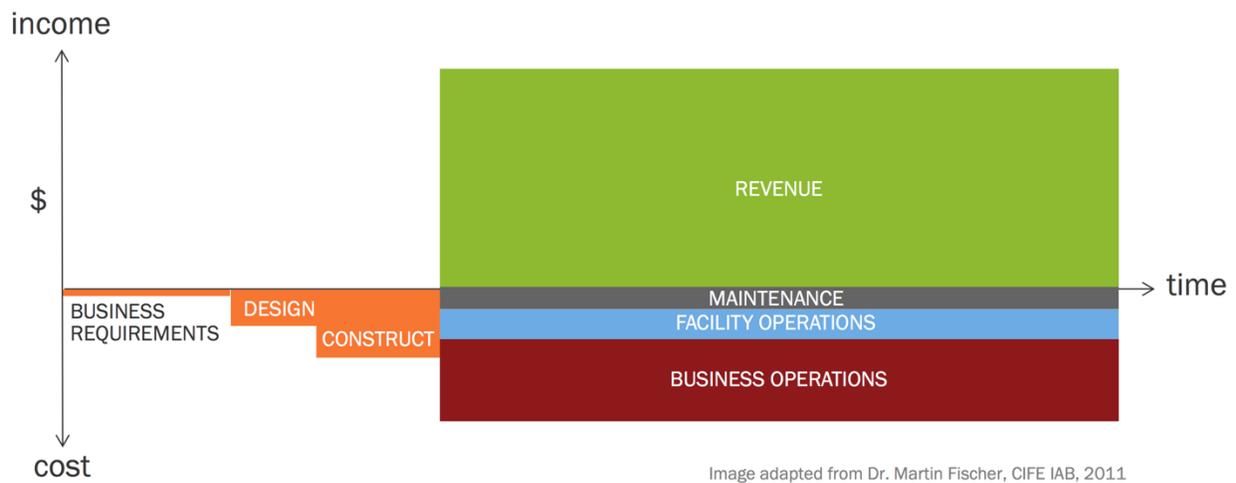


Image adapted from Dr. Martin Fischer, CIFE IAB, 2011

FIGURE 2: ECONOMICS OF PROJECT DELIVERY. COURTESY OF MARTIN FISCHER, STANFORD UNIVERSITY.

High Performing Building

A high-performing building is not necessarily one with thousands of square feet or meters and costs a fortune. It is one that is usable, operable, sustainable and build-able. All elements and systems work together, not in opposition to each other. Employees like the space because it is attractive, comfortable, and makes their jobs easier. It is a safe place and they don't have to worry about getting sick from hazardous materials that make it up. Building operators can maintain the equipment and infrastructure, and can keep the space clean and safe. Enterprise executives see that workers are more productive. Local government officials and citizens believe the building contributes positively to the community. Everyone is happy that the building is environmentally sustainable. Figure 3 is a section showing the bioclimatic strategy for the DPR Net Zero Energy building in Phoenix, AZ, which is also a very good workspace. Figure 4 lists typical criteria for each of the four main criteria of a high performing building.

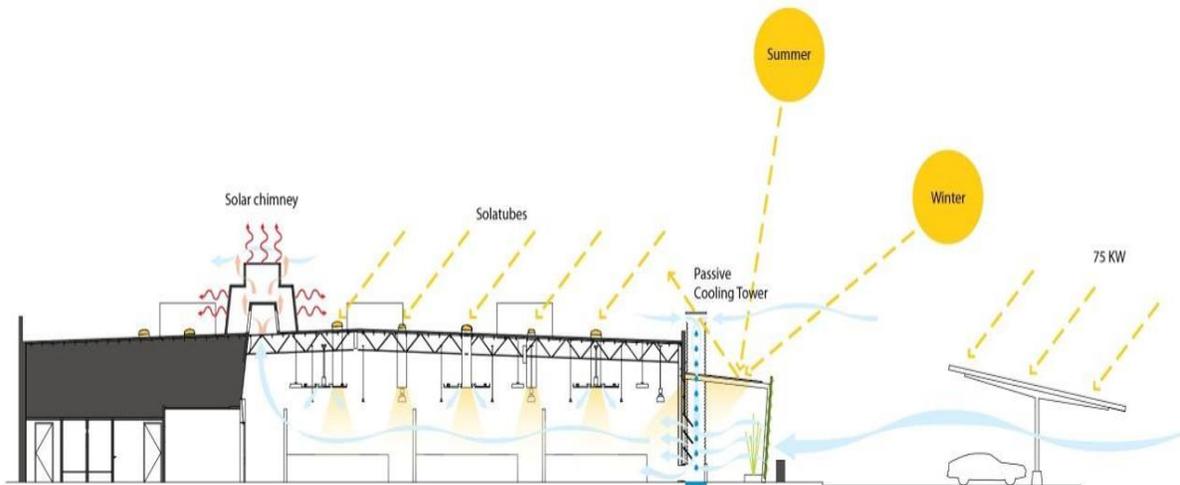


FIGURE 3: DPR PHOENIX NET ZERO ENERGY EXAMPLE OF A HIGH PERFORMING BUILDING. COURTESY OF SMITHGROUP JJR AND DPR CONSTRUCTION

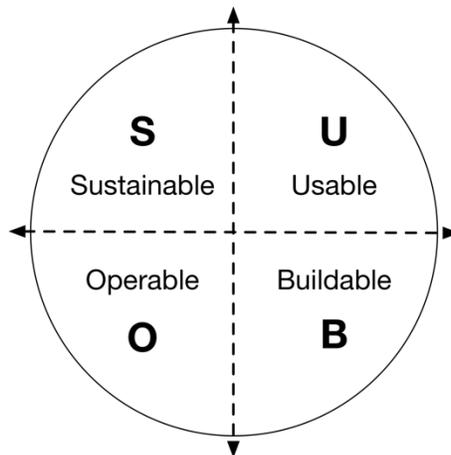


FIGURE 4: HIGH PERFORMING BUILDING CRITERIA

Complexity & Interdependence

Construction is dynamically complex, meaning many variables affect each other in ways that frequently cannot be predicted or controlled. People need things from others to complete their work, most often this is information. Whether this is recognized or not, the project is a network in which people must negotiate commitments to provide what they each need. Team members



must have the capacity to understand what is happening around them. Then they must learn together to move the project forward. Thinking that a valuable, high-performing building can be predictably created by people working in silos and exchanging fragmented information in weekly meetings makes no sense. Not to say that it hasn't or can't be done; the question whether project teams and owners can count on it. Figure 5 shows data flows during the design of a large research laboratory building. Figure 6 illustrates the social network of interdependent relationships among team members producing and exchanging design information.



FIGURE 5: DATA FLOWS IN DESIGN. COURTESY OF ADEPT MANAGEMENT CONSULTING.

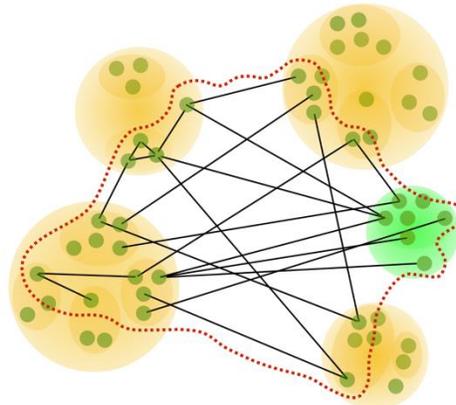


FIGURE 6: AN INTERDEPENDENT DESIGN NETWORK. COURTESY OF MARKKU ALLISON, SCAN

The Simple Framework for Integrating Project Delivery

The Simple Framework is a system model for integration. The authors of the book, *Integrating Project Delivery*, took the delivery of a valuable, high-performing building as the starting point to develop the model based on observing leadership, organization and practices that helped many project teams succeed. The first step is that the customer and team leaders agree that they intend to create a project organization that encourages and supports team members sharing what they know and the information they create. Team members need to use metrics to create feedback loops so they can continually learn and improve. They become good at building and maintaining trust so they can collaborate to create and use BIM and simulations, and make information and material flow as it is needed. The Simple Framework elements and enablers are interconnected and support each other. Doing one thing well inspires people to do more, especially if they understand the model. Figures 7 and 8 shows two views of the Simple

Framework for Integrating Project Delivery. The big idea they depict is that integration connects everything, because the Simple Framework is a system model.

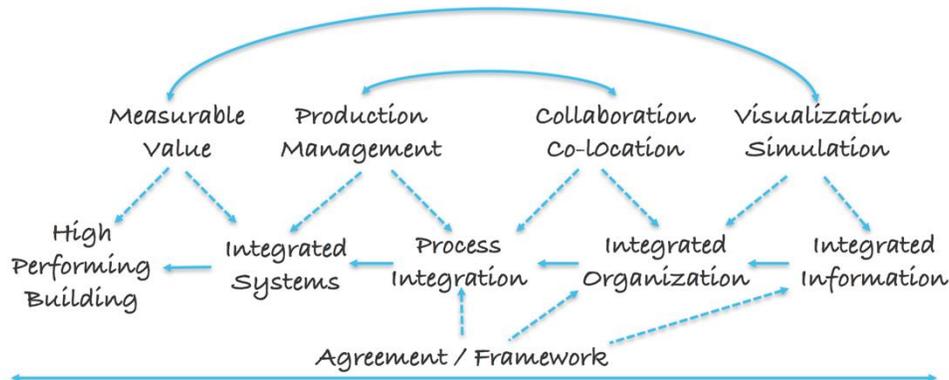


FIGURE 7: THE SIMPLE FRAMEWORK FOR INTEGRATING PROJECT DELIVERY.

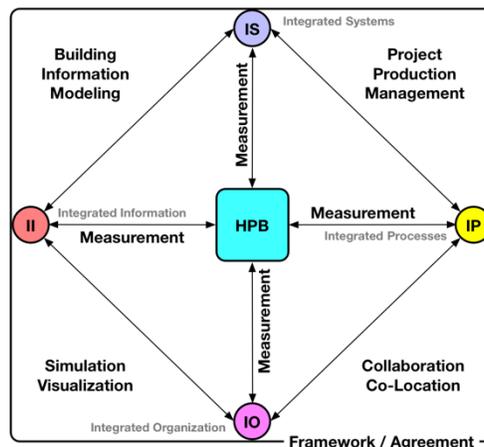


FIGURE 8: EVERYTHING IS CONNECTED

Starting Out

The first step is understanding why integration is an imperative and necessary. The next is to go to work, inventing or applying methods and practices that integrate work and decisions. After that, there's no stopping.