# BREAKING THE STATUS QUO

Transforming Building System Delivery with Connected Commissioning & Advanced Analytics

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ALTURA

www.alturassociates.com

# PART ONE:
## Current Process
*(Also known as "The Status Quo.")*

### Mechanical systems and controls are a major driver of operating costs, occupant experience, and meeting decarbonization goals.

Still, the process by which they are designed, installed, and commissioned might be holding your asset back. The standard playbook of new construction is too often influenced by process inertia, siloed decision-making, and opaque incentives. With the right process and delivery model, outcomes can be improved while also reducing costs.

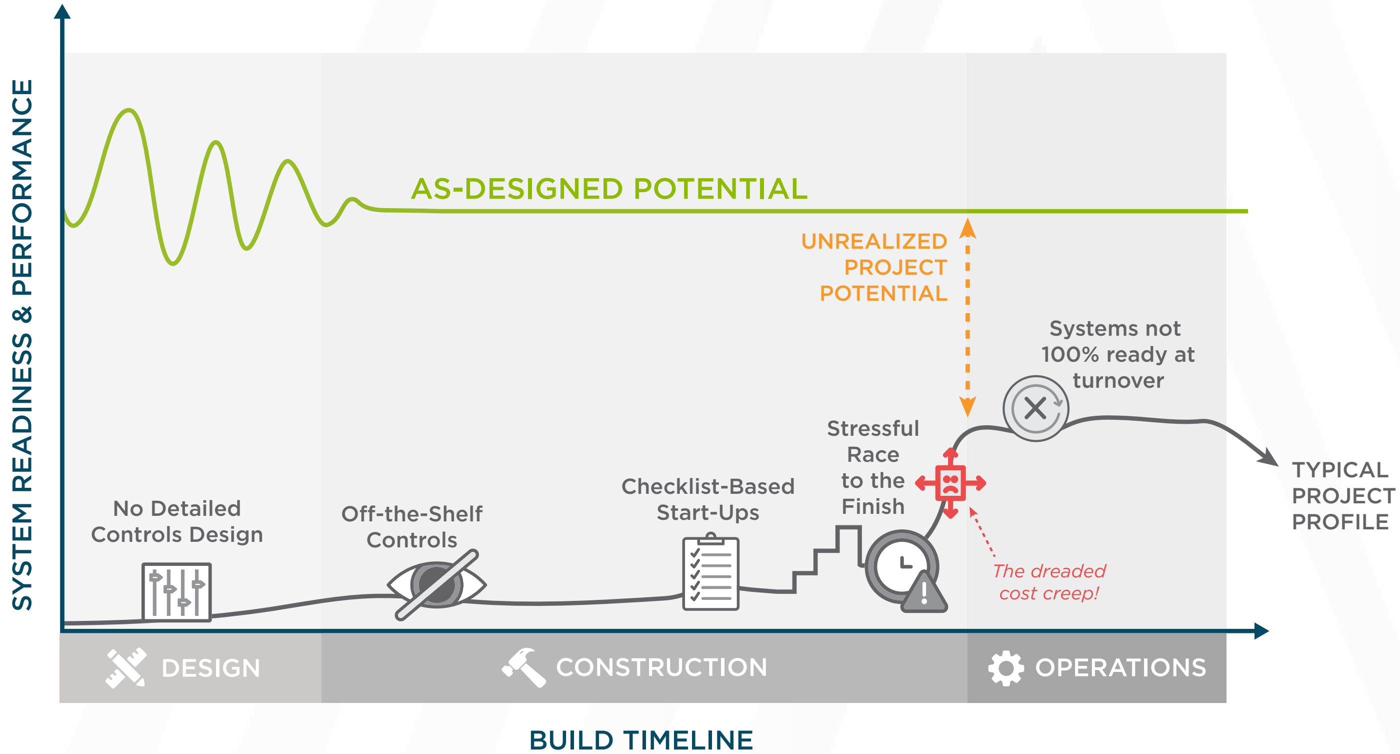


**FIGURE 1: Status Quo for Building Performance in New Construction**

Asset delivery begins with the design phase, where an architect and engineer are responsible for translating the owner's vision into a detailed model. As shown in Figure 1, the design process frequently plays out under intense time and pressure to complete enough design details to get into construction, trusting contractors and vendors to fill in the gaps. Although seemingly trivial, these initial design decisions or indecisions have a rippling effect, compounding the consequences for Mechanical, Electrical, and Plumbing (MEP) installation, commissioning, and performance.

During the procurement process, incomplete design documents leave room for contractors to set the stage for significant change orders or simply rely on what they used for the last job. Considering that mechanical and electrical systems compose up to 25% of a typical project contract value, getting accurate MEP bids is a key determinant of total project cost. Our own research indicates that average mechanical and electrical change orders result in a 28% increase to the overall MEP cost!

In the commissioning (Cx) phase, the Cx agent tests and validates the function of the building system against the engineer's specifications. However, the conventional Cx process is stuck without the necessary definition of sequences and performance to be able to generate meaningful checklists. A report by FMI states that on average, 52% of rework within the construction industry was caused by poor project data and communication[1]. Without a real-time, digital view of the entire system, Cx agents are limited to pointing out deficiencies instead of resolving them. The result is building systems that never achieve their performance potential. Research into past projects indicates that of the last 30% of contingency budgets spent on construction projects, over half are related to MEP.

**28%**

**Average MEP change order increase to overall project cost.**

**52%**

**Rework within the construction industry caused by poor project data and communication**

Throughout occupancy and turnover, the lack of transparent data can significantly impact ongoing operations (Figure 1). These current processes contribute to eleventh-hour change orders and rework, causing too many new buildings to have lingering MEP issues after turnover. To an owner, this means increased operation costs, disruption to tenants and occupants, and the potential for lost rents.

The above illustrates the norms of today's commercial construction projects rather than the exception. A growing number of innovative owners are unwilling to settle for the status quo and have sought a better way forward. New, performance-driven systems delivery methods, supported by state-of-the-art analytics and technology integration expertise, enable the entire project team to perform at their best, creating a better, unprecedented outcome for buildings in new construction.

**1. Autodesk, 2018, Construction Disconnected: The High Cost of Poor Data and Miscommunication.**

# PART TWO:
## The Solution

Innovation, people & technology will reduce project complexity.

**Innovative owners and project teams have experimented with and begun to accept a new methodology for delivering building systems. These firms have devised new processes and technology paradigms to significantly improve asset delivery for all stakeholders and operations for owners.**

## PROCESS

As performance offerings get more complex, MEP delivery methods aren't keeping pace with the requirements owners need from their systems, including reducing costs, better building experiences, and saving energy. However, orienting an approach around the owner's acceptance criteria to orchestrate this transformation is gaining momentum for those bold enough to understand that it is both people and process, along with technology, that will help them realize massive savings and project clarity.

Before project kick-off, the owner develops a clear understanding of project success by identifying long-term performance goals to align stakeholders. This method initiates more detailed and relevant project documents, allowing the general contractor (GC) to secure the most complete and competitive bids. Increased design transparency leads to a reduction in change orders, easier coordination among trade partners, and better project procurement.

These new processes have also improved project delivery by utilizing bench testing for MEP equipment. Bench testing ensures bugs are worked out of the system before installation, allowing for a more seamless installation and high functional confidence at delivery. Upfront quality control prevents backend scrambling, schedule delays, and band-aid solutions in later phases of the project.

## TECHNOLOGY

In addition to new overall delivery methods, owners and designers must require their teams to use a "connected" or digital approach for building commissioning. This approach results in the realization of the full performance potential for MEP systems. Analytics-driven, system-level commissioning guarantees the entire Building Automation System (BAS) is running in accordance with the intended design, contract documents, and owner's acceptance criteria. A digital display of performance analytics allows teams to measure building progress throughout construction, providing accurate insight into system efficiency. This real-time data helps issues to be identified—and resolved—earlier, ensuring projects are delivered on time with certainty of high performance.

In practice, this technology benefits all parties, providing holistic transparency as MEP systems are commissioned towards the conclusion of a project. When project costs and schedules are most compressed, stakeholders have the visibility to accelerate solutions for change orders, underperforming equipment, and other costly rework. These analytics resources continue to drive value through warranty and O&M phases, continually supporting the building after turnover. With a clear view into the building's efficiency, owners can feel confident that their building maintains performance standards and is unscathed by lingering MEP issues.

## RESULTS

These new processes and technology enhancements have significantly improved asset delivery experiences for owners and project teams. A process driven by the owner's acceptance criteria helps drive an efficient procurement phase and promotes holistic performance goals. New technology encourages analytics-based decision-making for troubleshooting and performance testing. This new approach provides transparency throughout the project lifecycle, giving building ownership back to the client. Owners are more satisfied with the performance of their assets and user experiences are enhanced for future occupants.

> This real-time data helps issues to be identified — and resolved — earlier, ensuring projects are delivered on time with certainty of high performance.

**When evaluating a firm for future partnership, they must provide real-time data and data analytics, communicate in an open, transparent system, and promote turnkey services with minimal installation.**

# PART THREE:
## Altura's Performance Delivery
### Transforming the Smart Building Automation Process

Altura has provided innovative solutions to commissioning and system delivery for over a decade, impacting more than two million square feet of work across 200+ engagements to date. This forward-thinking Connected Commissioning methodology was developed as a solution to the outdated construction model which lacks the full potential of building systems' optimization. Over the years, Altura has built an array of technological solutions to support this mission, their clients, and project teams.

Altura's Performance Delivery offering redefines building performance in new construction, as shown in Figure 2. This delivery consists of concurrent commissioning services, BAS design and optimization, and enhanced controls coordination services, contributing to an improved asset and asset delivery experience. This integrated approach, driven by data analytics, optimizes the commissioning process, creating a level of accountability and transparency to ensure all parties are satisfied before occupancy occurs. Altura's analytics platform (Figure 3) brings visibility into the construction process, providing the necessary quality control to elevate teams and achieve project results. This approach to performance delivery results in lower initial and ongoing maintenance costs while delivering a high-performance facility with reduced risk.

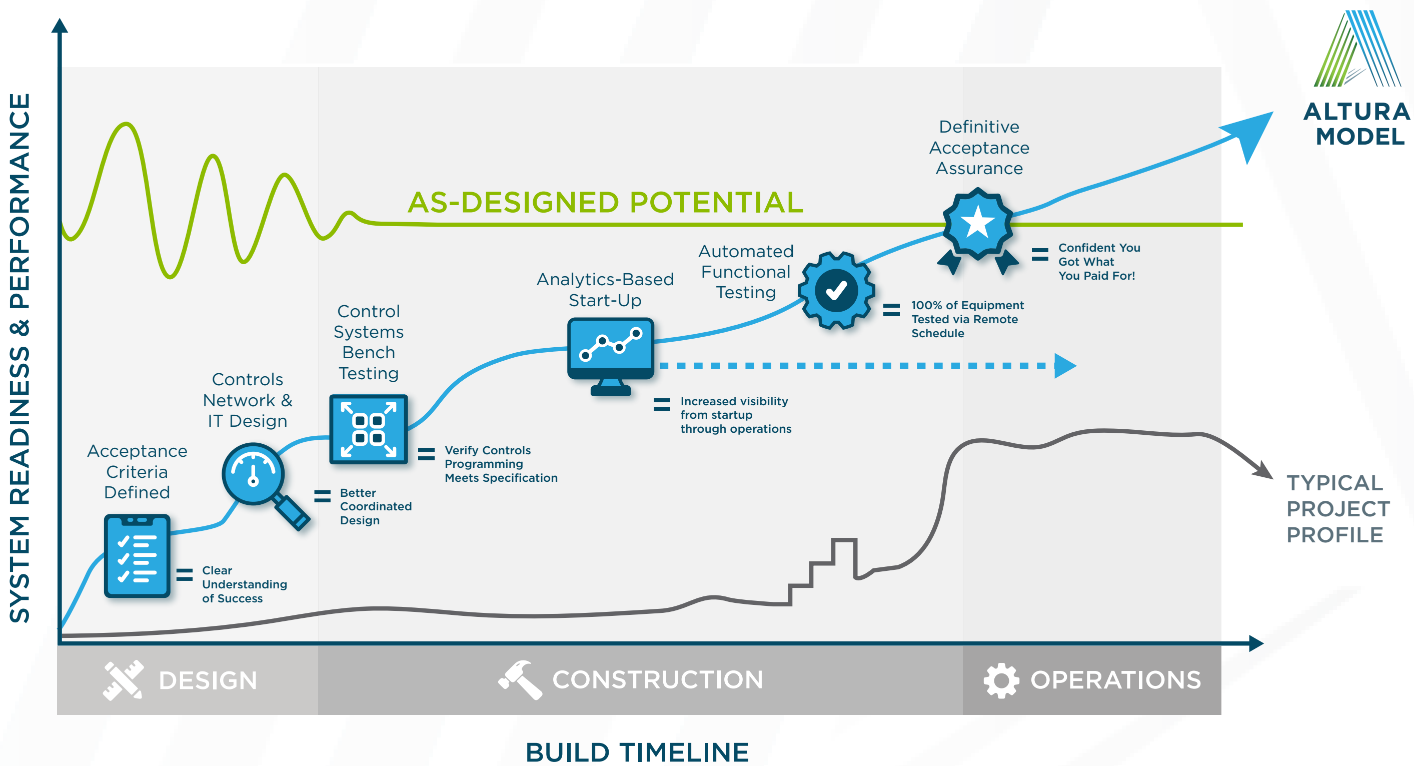


**FIGURE 2: Altura's Influence on building performance in new construction employs analytics-driven commissioning, creating visibility not previously experienced during the construction phase in building.**

# CASE STUDY: LARGE HOSPITAL MEDICAL BUILDING

A California-based national healthcare system first approached Altura as part of its continued pursuit of leading the way in healthcare innovation. The client was exploring solutions to address their disappointment with existing commissioning practices and subsequent building performance. They resonated with Altura's Performance Delivery offering and were impressed by their proactive approach, new processes, and secure, IT-friendly analytics technologies. Their analytical approach was piloted at a medical office building in Southern California, working towards incorporating connected commissioning to new buildings across the entire healthcare system.

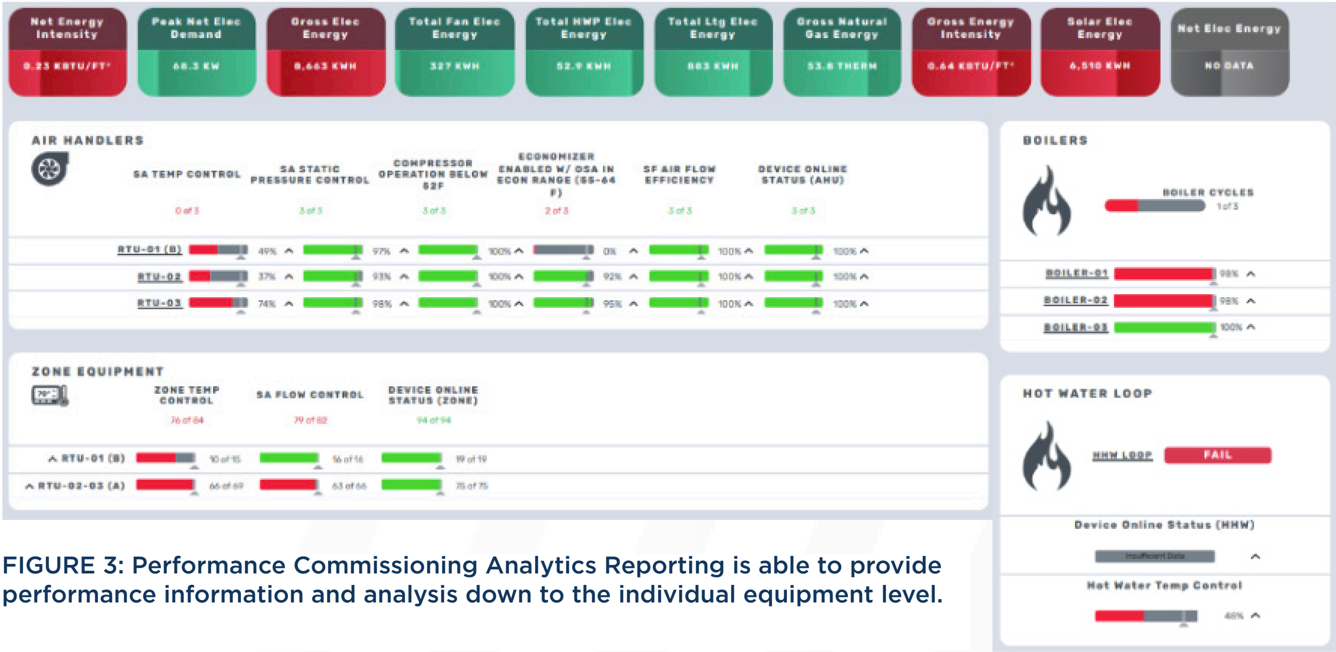


**FIGURE 3: Performance Commissioning Analytics Reporting is able to provide performance information and analysis down to the individual equipment level.**

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Altura provided a full scope of Performance Delivery services as referenced in the list below. When Altura's analytics quickly diagnosed performance problems with three of the building's air handlers, the data was leveraged to compel the vendor to resolve the issues immediately, without a fight. Without the real-time performance visibility, it would have never been caught, leaving the owner with an underperforming system, or have been a far larger problem later down the road. The building analytics continued throughout the warranty period, ensuring potential issues were identified and resolved under warranty and guaranteeing the building was tuned to operate at peak efficiency.

This project was recognized by the Building Commissioning Association for the Excellence in Building Commissioning Award. This performance delivery approach became the new standard for the nationwide healthcare system, attributing to the pilot's success. Altura's continued work supports the client's commitment to GHG emissions reductions and is projected to save $900k per year in maintenance costs across the initial sites in the program.

## Mechanical Office Building Performance for Delivery Scope:

1. Design documentation for the BAS
2. Supported bidding of the controls network with local BAS providers
3. Developed and deployed client-standard optimization programming
4. Documented standards to support future building development
5. Usage of analytics platform in support of warranty phase