Optimizing for Success:

Processes, Tools and Tactics to Help Architects Achieve Their Goals

The American Institute of Architects

Project Delivery

an AIA Knowledge Community

Copyright notice

Compliance statement

“AIA Knowledge” is a Registered Provider with The American Institute of Architects Continuing Education Systems (AIA/CES). Credit(s) earned on completion of this program will be reported to AIA/CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This program is registered with AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Learning objectives

- Identify the factors that enhance an architect's ability to achieve design intent during design, documentation and construction phases.
- Quantify the impact of factors outside the reasonable control or influence of the design/construct team can have an impact on achieving design intent.
- Present ways to convert waste into higher value for the owner and how buildings can **now** be planned and designed toward more certain outcomes – and in a fraction of the time and effort that traditional design/delivery. methods take.
- Demonstrate new tools toward fully-integrated, highly-automated building development to deliver a capital project.

Agenda

- New research by Dodge Data & Analytics
- Rethinking Construction by Building Catalyst

Dodge research

- Overview of research
- Frequency of achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

Design Intent

Every building design project regardless of how modest or grand, simple or complex, has a design intent relevant to its functional and aesthetic objectives and its budget and logistical constraints.

Achieving or exceeding the design intent is a high priority for architects, but design and construction is a complex process with many variables that can impact satisfactory achievement of design intent.

Design Intent

What can architects do during the design and construction of a building project to optimize the achievement of design intent?

Design Intent

Online survey:

- *212 Architects (USA) in December 2019*
- *Annual revenue for architectural services including interior design but excluding engineering construction or other services of at least $500,000*

Design Intent

The purpose of this study is to:

- *Identify factors, conditions, practices and behaviors that have the most impact on successful achievement of design intent.*

For this study “design intent” is:

- *The state of your expectation for scope, quality, cost, aesthetics and function of a building project at the point you consider the design to be complete and approved, even if construction started before that point for schedule acceleration reasons.*

Design Intent

If design must be changed during construction:

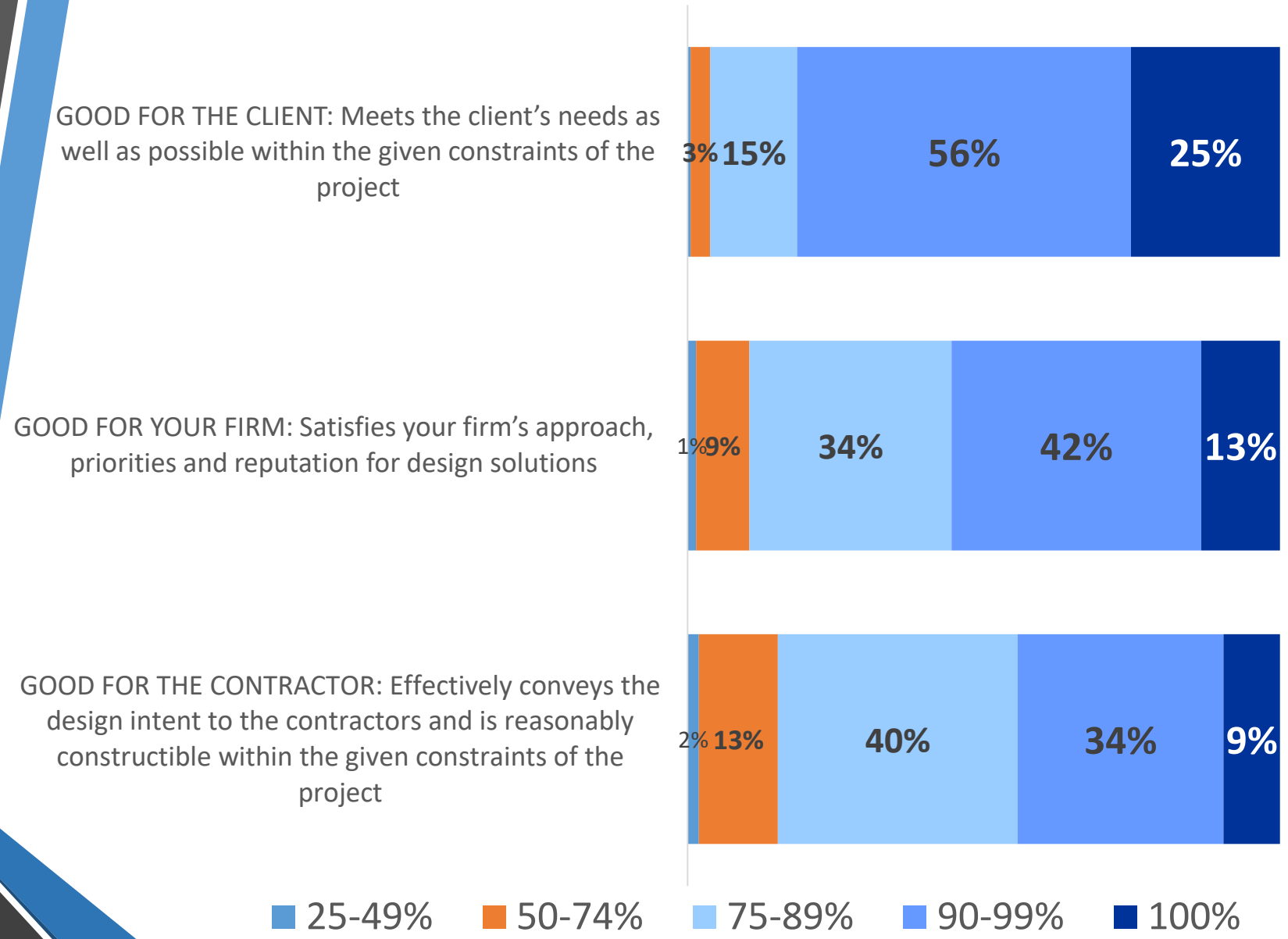
- *If it caused by factors legitimately **outside the control of the design and construction team** (e.g., unforeseen site conditions, significant changes in market conditions, client-directed changes) consider **that modified design** to be what you evaluate for achieving design intent.*

- *If caused by **factors that could/should reasonably have been avoided** (e.g., design, construction, coordination, supplier or owner-related errors, omissions, miscommunications, etc.) considered as **impediments to achieving design intent and not legitimate modifications** to the design intent.*

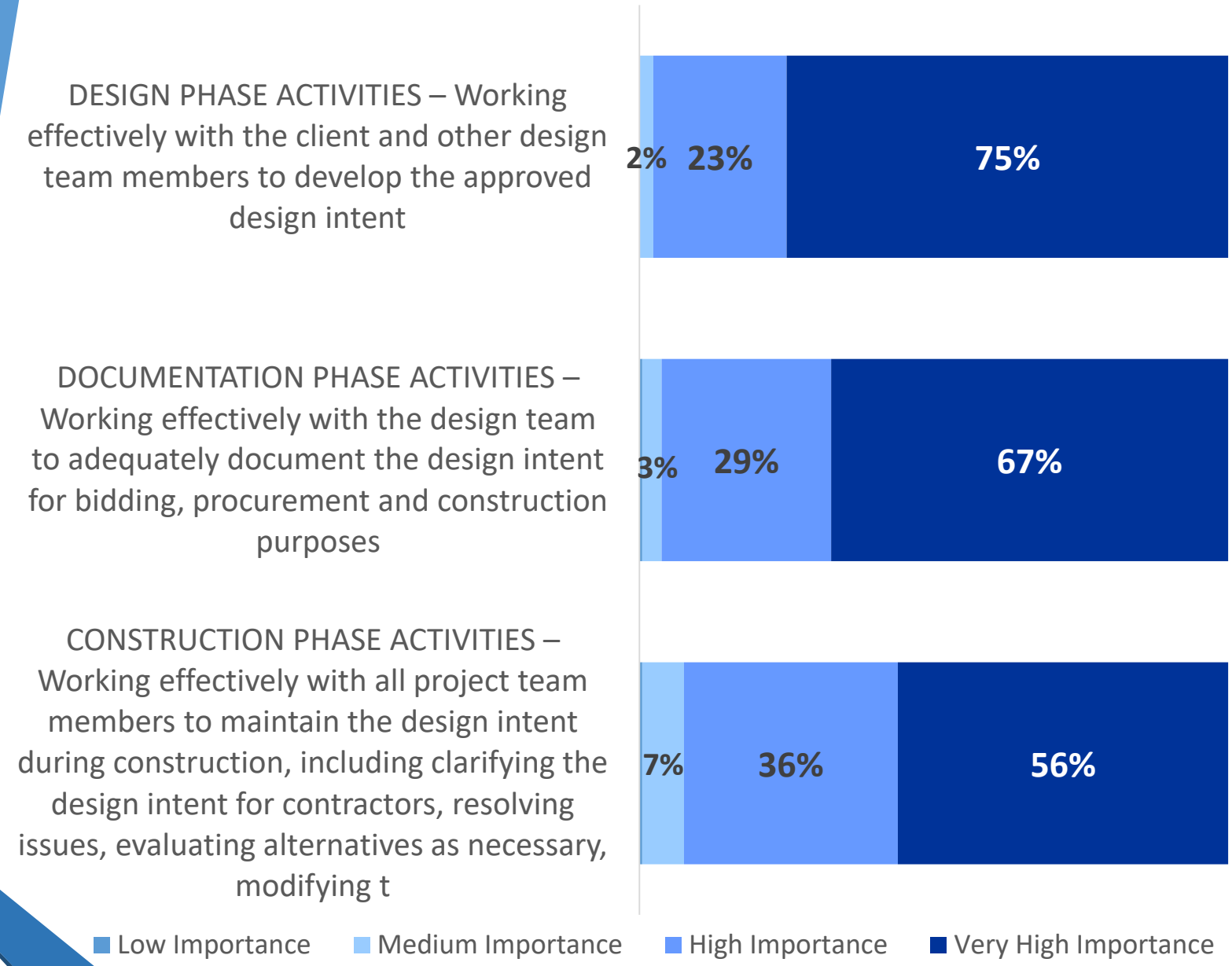
Dodge research

- Overview of research
- Achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

On what percentage of your projects are you satisfied that your design team has *developed a design intent with the client* that is…?



How important is *each phase* to achieving design intent?

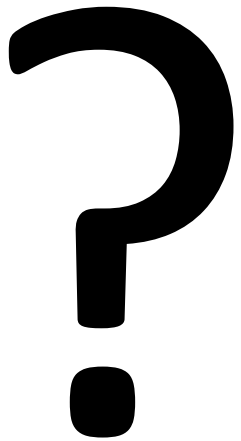


Dodge research

- Overview of research
- Achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

DESIGN PHASE

Rate the *impact* of each of these factors on your ability to successfully develop the design intent with the client

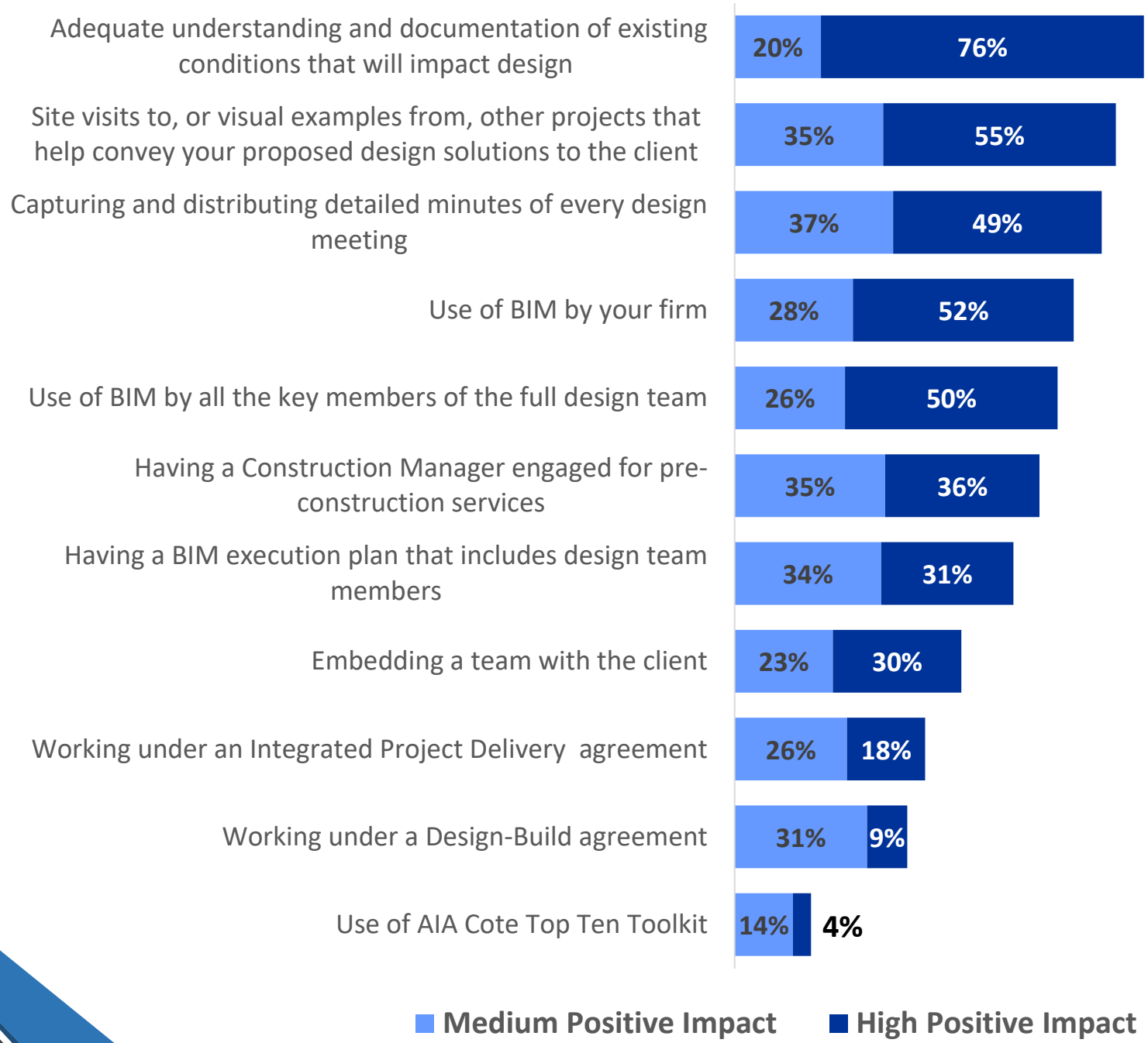


FACTORS SURVEYED (Shown alphabetically)

1. **Adequate understanding and documentation of existing conditions that will impact design**
2. **Capturing and distributing detailed minutes of every design meeting**
3. **Embedding a team with the client**
4. **Having a BIM execution plan that includes key members of the design team**
5. **Having a Construction Manager engaged for pre-construction services**
6. **Site visits to, or visual examples from, other projects that help convey your proposed design solutions to the client**
7. **Use of AIA COTE Top Ten Toolkit**
8. **Use of BIM by all the key members of the full design team**
9. **Use of BIM by your firm**
10. **Working under a Design-build agreement**
11. **Working under an Integrated Project Delivery agreement**

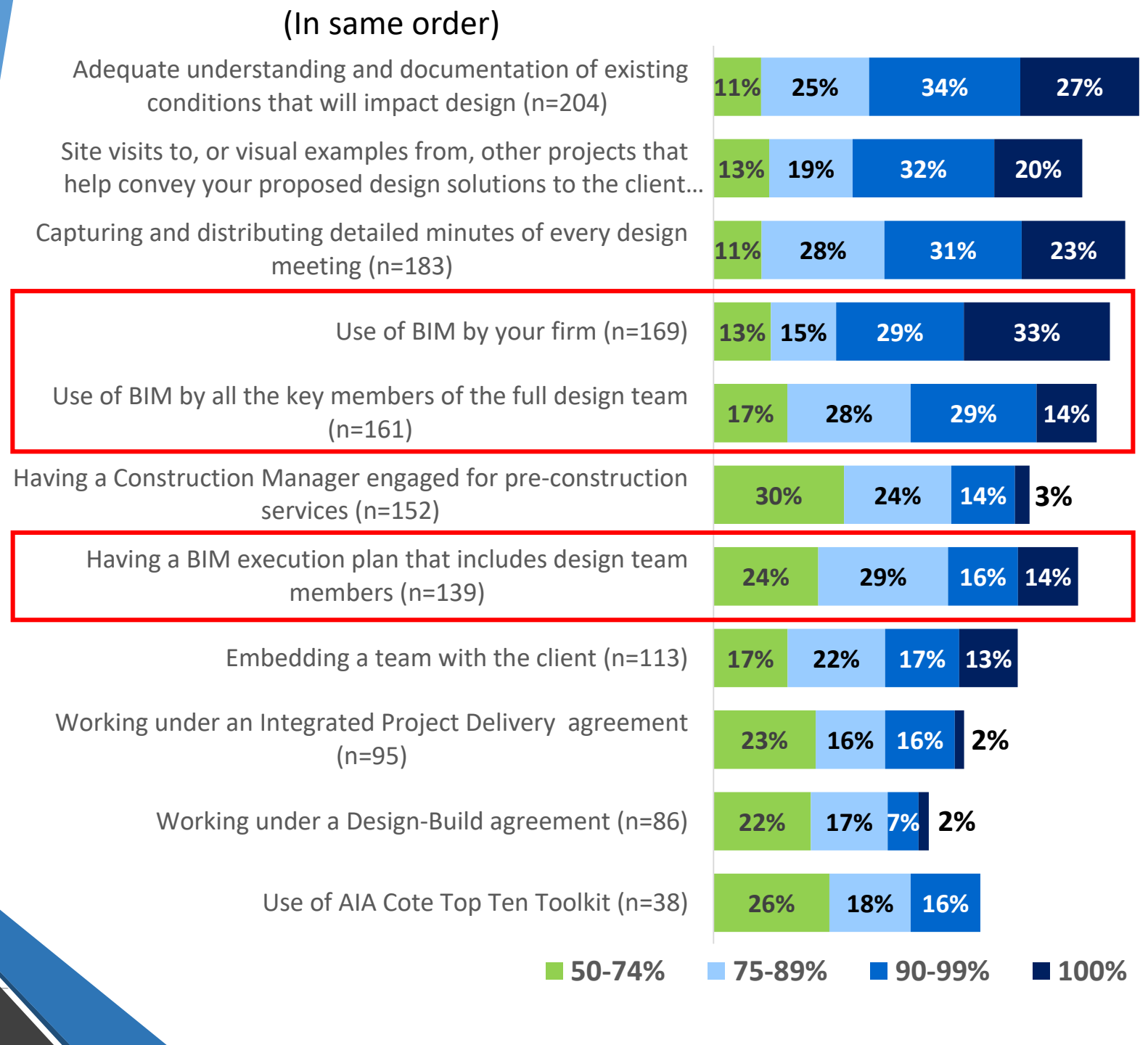
DESIGN PHASE

Rate the *impact* of each of these factors on your ability to successfully develop the design intent with the client



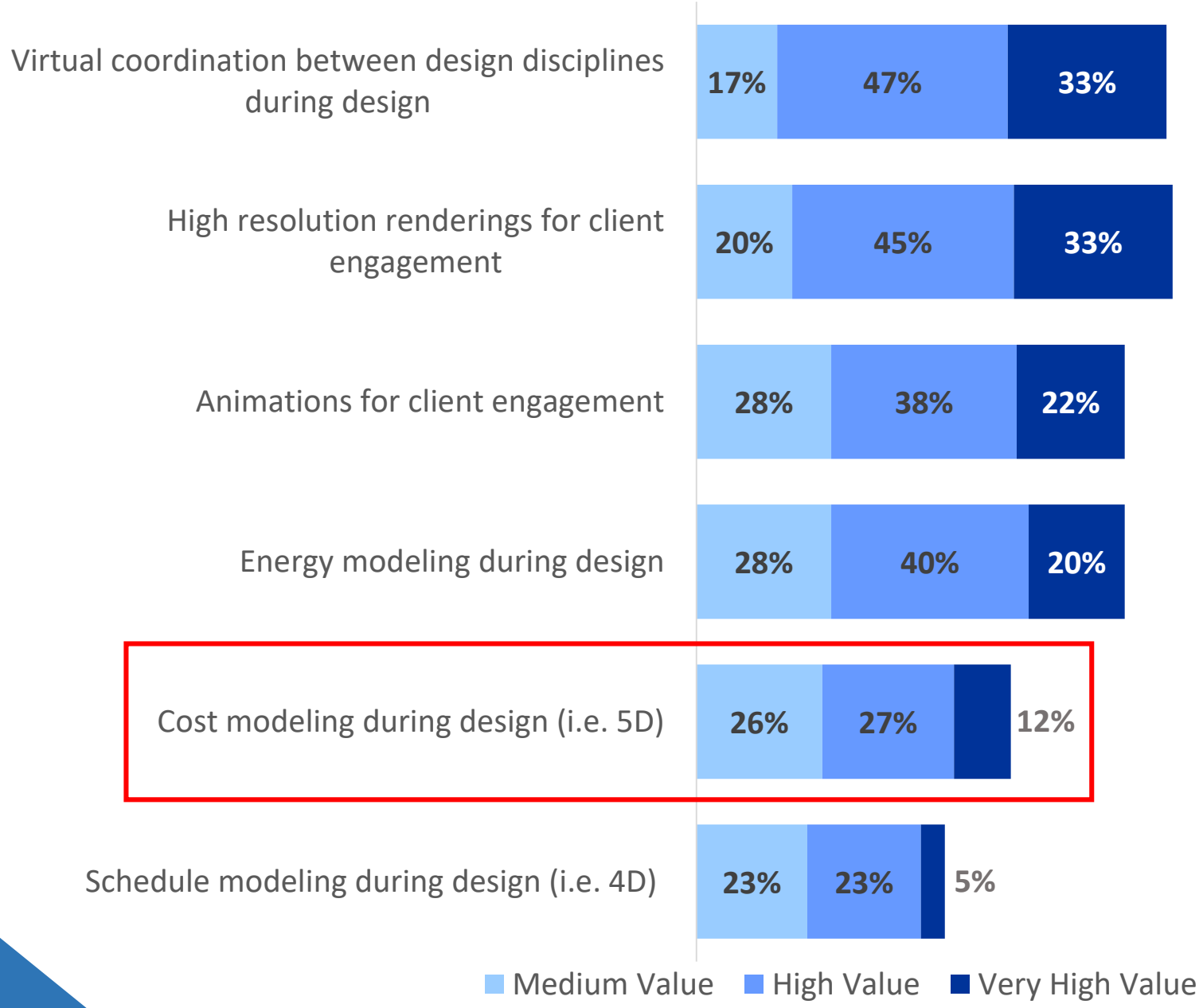
DESIGN PHASE

Frequency of the factors that help to successfully develop the design intent with the client



BIM IN THE DESIGN PHASE

How *valuable* are each of these BIM-related activities during design?
(before contract documents)

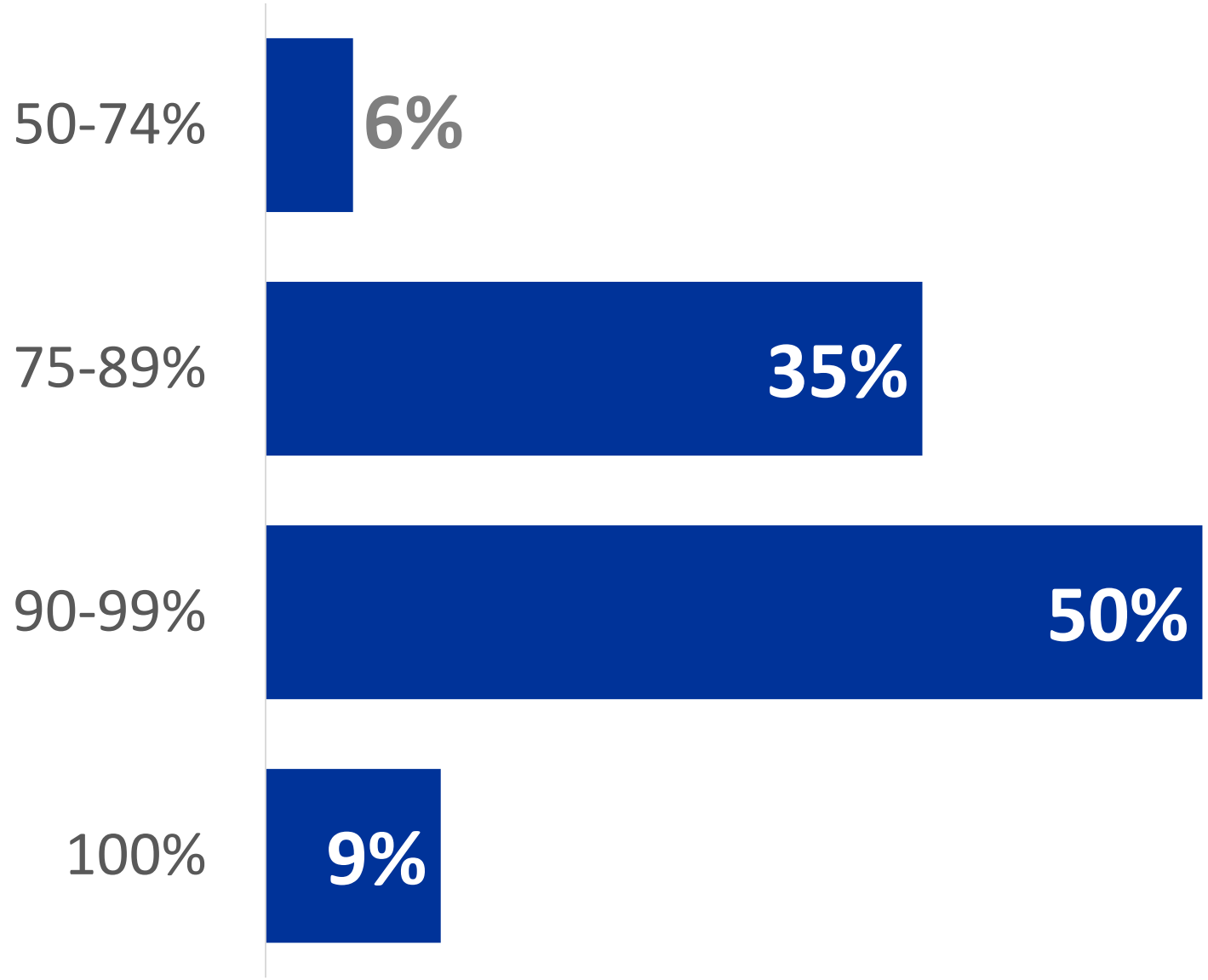


Dodge research

- Overview of research
- Achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

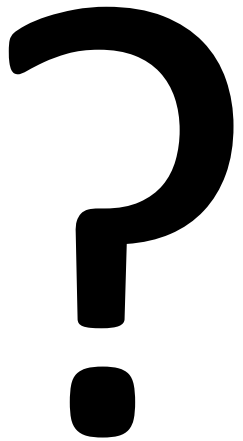
DOCUMENTS PHASE

On what percentage of your projects are you satisfied that your *design team has documented the design intent* in its contract documents?



DOCUMENTS PHASE

Rate the *impact* of each of these factors on your ability to successfully document the design intent in your contract documents

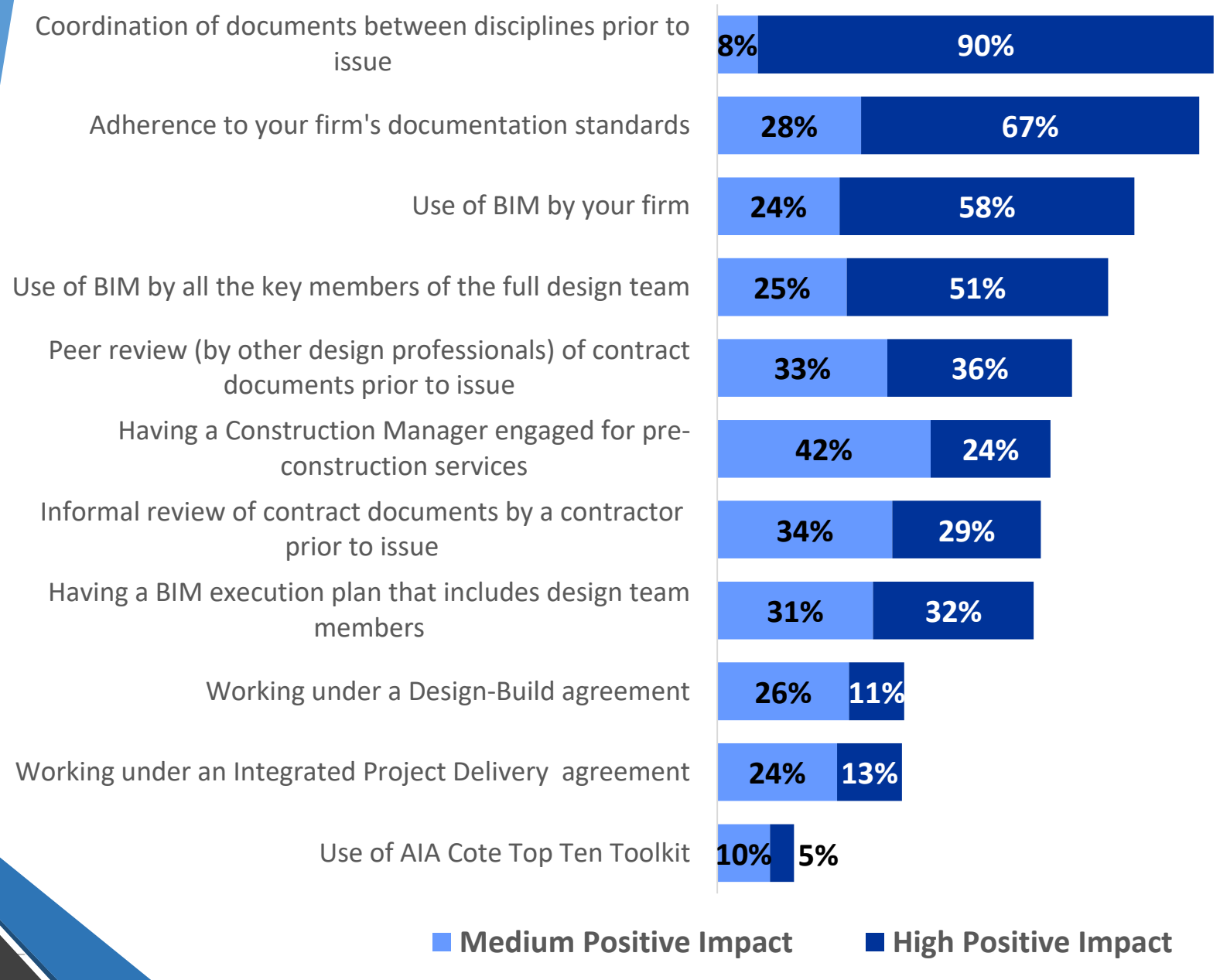


FACTORS SURVEYED (Shown alphabetically)

1. **Adherence to your firm's documentation standards**
2. **Coordination of documents between disciplines prior to issue**
3. **Having a BIM execution plan that includes design team members**
4. **Having a Construction Manager engaged for pre-construction services**
5. **Informal review of contract documents by a contractor prior to issue** (when there is not a contractor on the project for pre-construction services)
6. **Peer review** (by other design professionals) **of contract documents prior to issue**
7. **Use of AIA COTE Top Ten Toolkit**
8. **Use of BIM by all the key members of the full design team**
9. **Use of BIM by your firm**
10. **Working under a Design-build agreement**
11. **Working under an Integrated Project Delivery agreement**

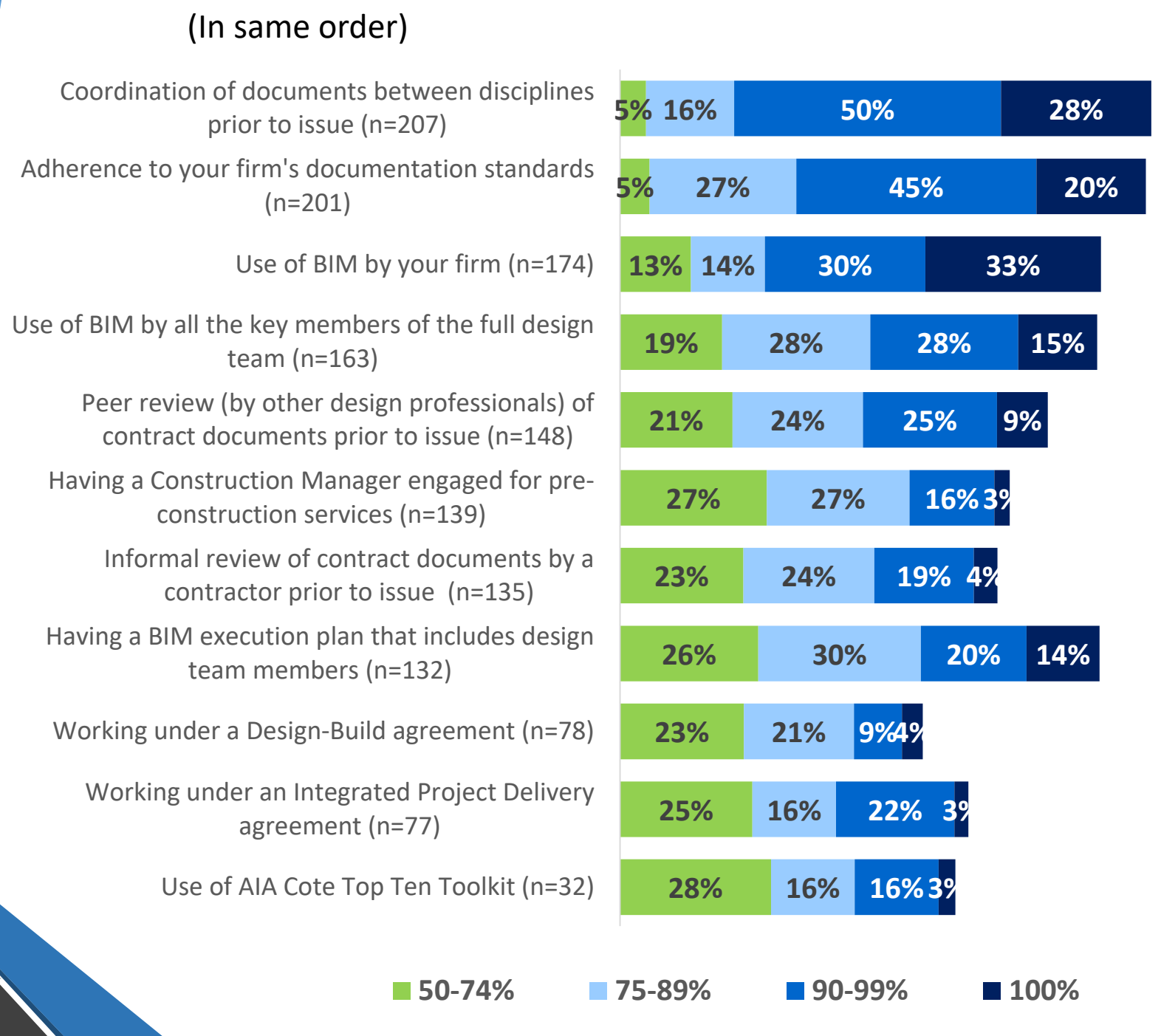
DOCUMENTS PHASE

Rate the *impact* of each of these factors on your ability to successfully document the design intent in your contract documents



DOCUMENTS PHASE

Frequency of the factors that help to successfully document the design intent in your contract documents

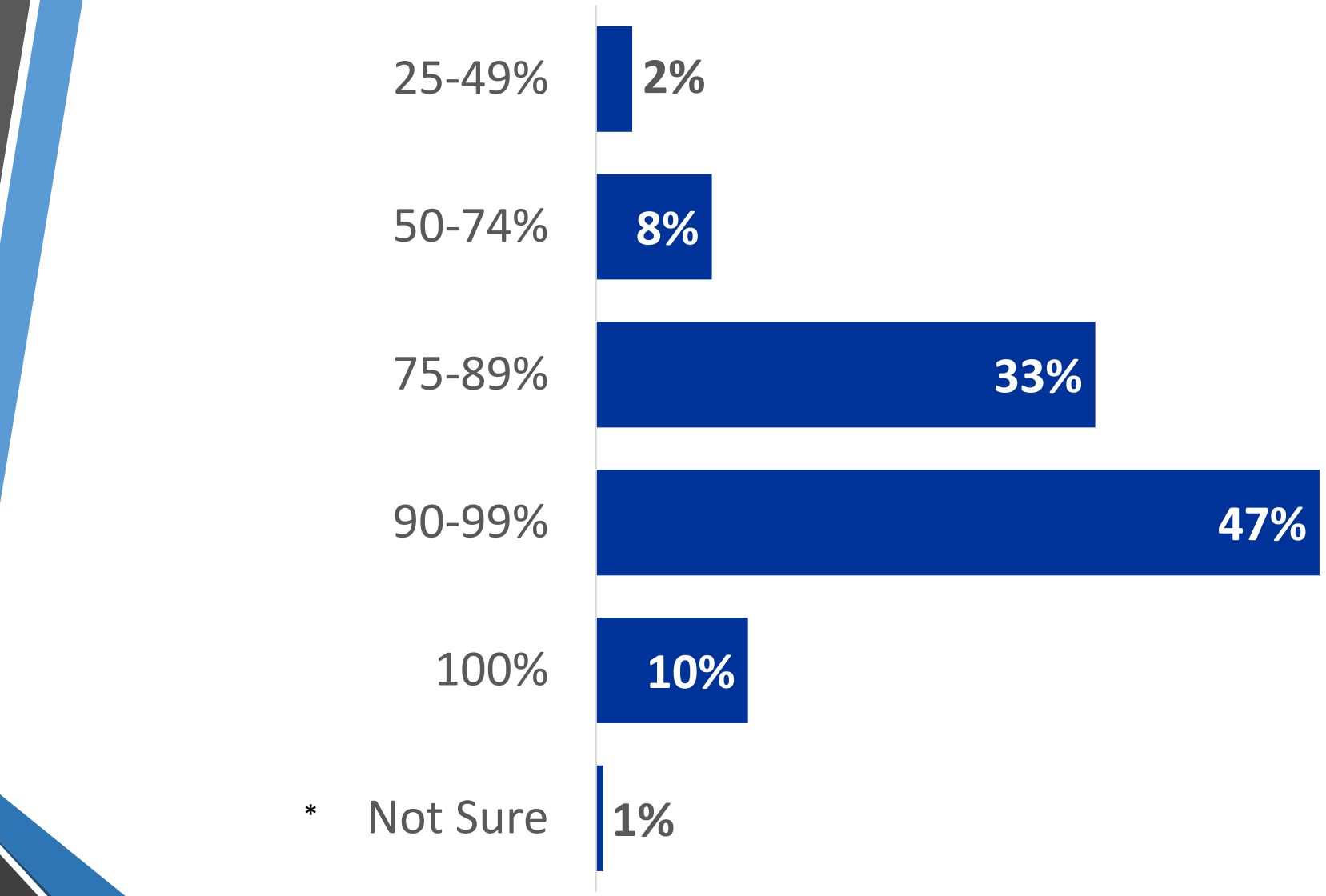


Dodge research

- Overview of research
- Achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

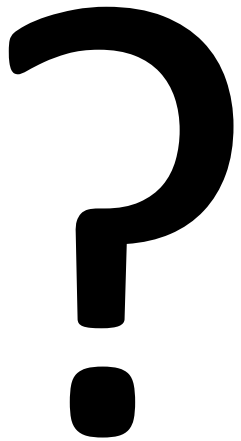
BUILD PHASE

On what percentage of your projects are you satisfied that your *design team has worked effectively with the owner and/or owner's representative* to maintain the design intent during construction?



BUILD PHASE

Rate the *impact* of each of these factors on your ability to successfully *maintain the design intent during construction*

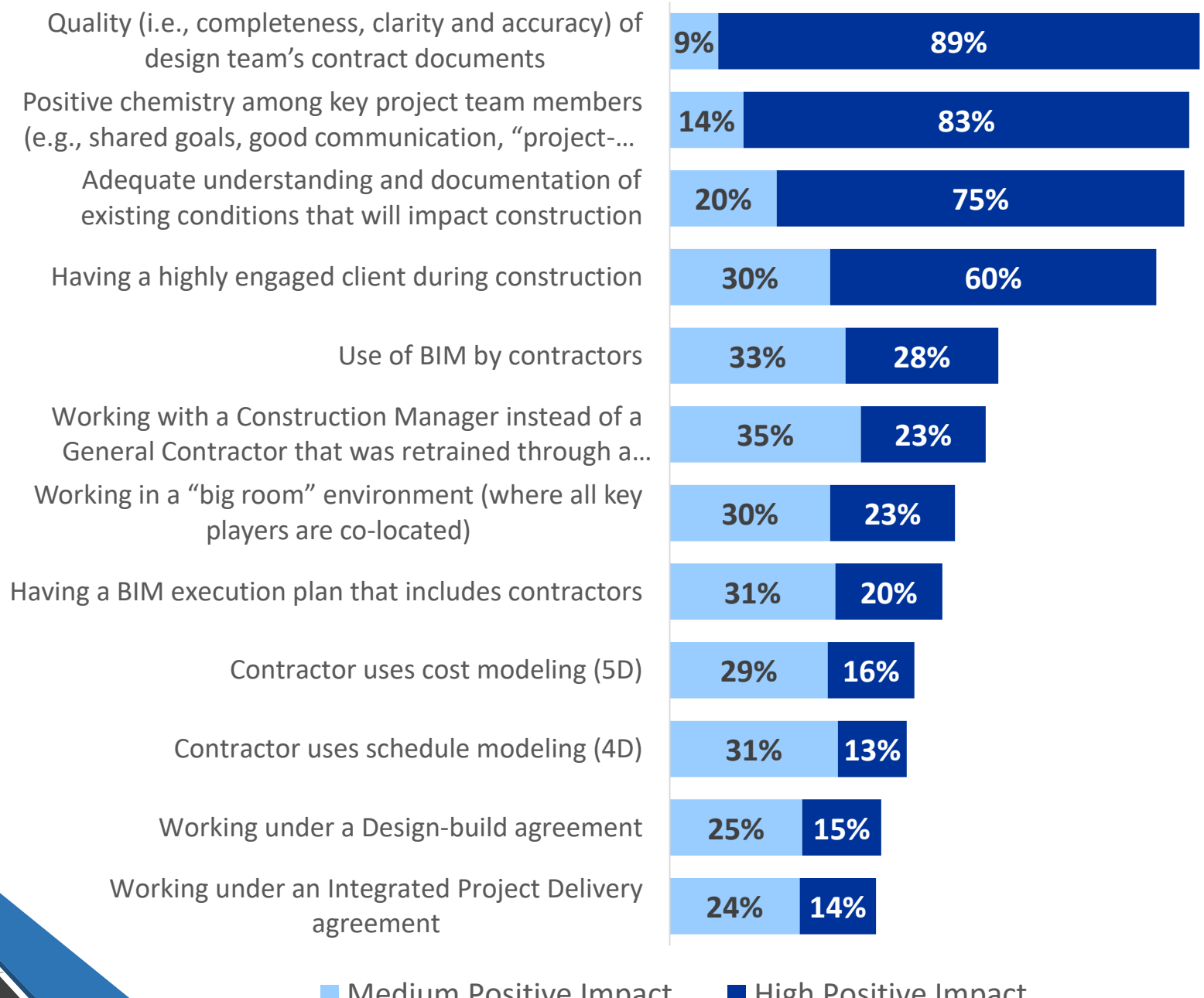


FACTORS SURVEYED (Shown alphabetically)

1. **Adequate understanding and documentation of existing conditions that will impact construction**
2. **Contractor uses cost modeling** (5D)
3. **Contractor uses schedule modeling** (4D)
4. **Having a BIM execution plan that includes contractors**
5. **Having a highly engaged client during construction**
6. **Positive chemistry among key project team members** (e.g., shared goals, good communication, "project-first" attitude)
7. **Quality** (i.e., completeness, clarity and accuracy) **of design team's contract documents**
8. **Use of BIM by contractors**
9. **Working in a "big room" environment** (where all key players are co-located)
10. **Working under a Design-build agreement**
11. **Working under an Integrated Project Delivery agreement**
12. **Working with a Construction Manager** (instead of a General Contractor that was retrained through a design-bid-build process)

BUILD PHASE

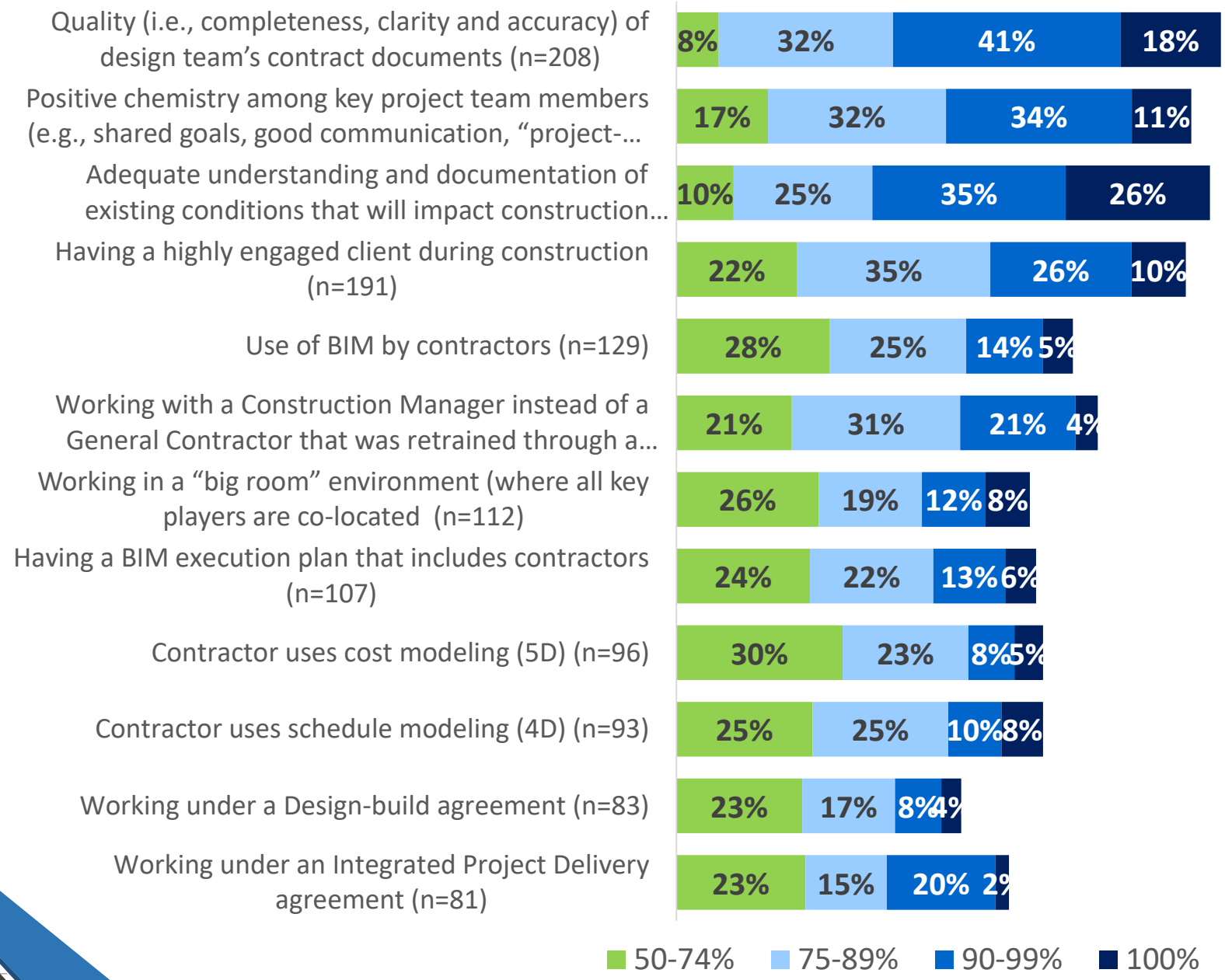
Rate the *impact* of each of these factors on your ability to successfully *maintain the design intent during construction*



BUILD PHASE

Frequency of the factors that help to successfully maintain the design intent during construction

(In same order)

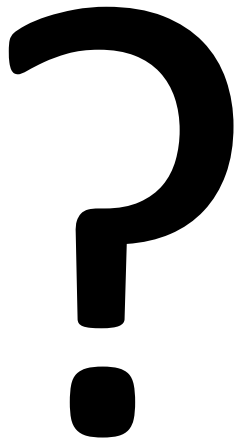


Dodge research

- Overview of research
- Achieving design intent
- Design phase activities
- Documentation phase activities
- Construction phase activities
- Factors outside control of design/construct team
- Major drivers and obstacles

OTHER FACTORS THAT IMPEDE ACHIEVEING DESIGN INTENT

How much do you agree or disagree with each of these statements?

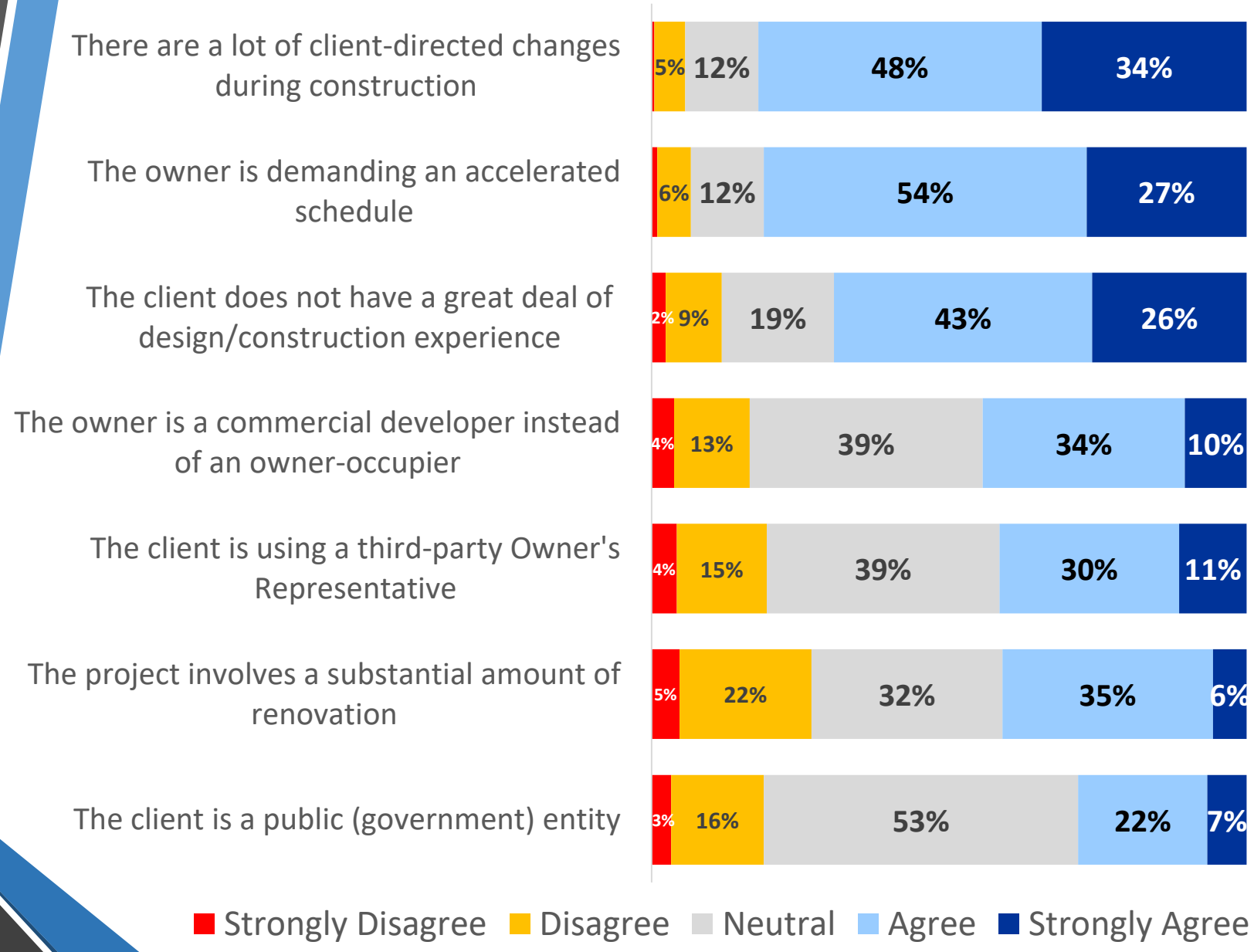


FACTORS SURVEYED (Shown alphabetically)

1. **Client does not have a great deal of design/construction experience**
2. **Client is a public** (government) **entity**
3. **Client is using a third-party Owner's Representative**
4. **Owner is a commercial developer instead of an owner-occupier**
5. **Owner is demanding an accelerated schedule**
6. **Project involves a substantial amount of renovation**
7. **There are a lot of client-directed changes during construction**

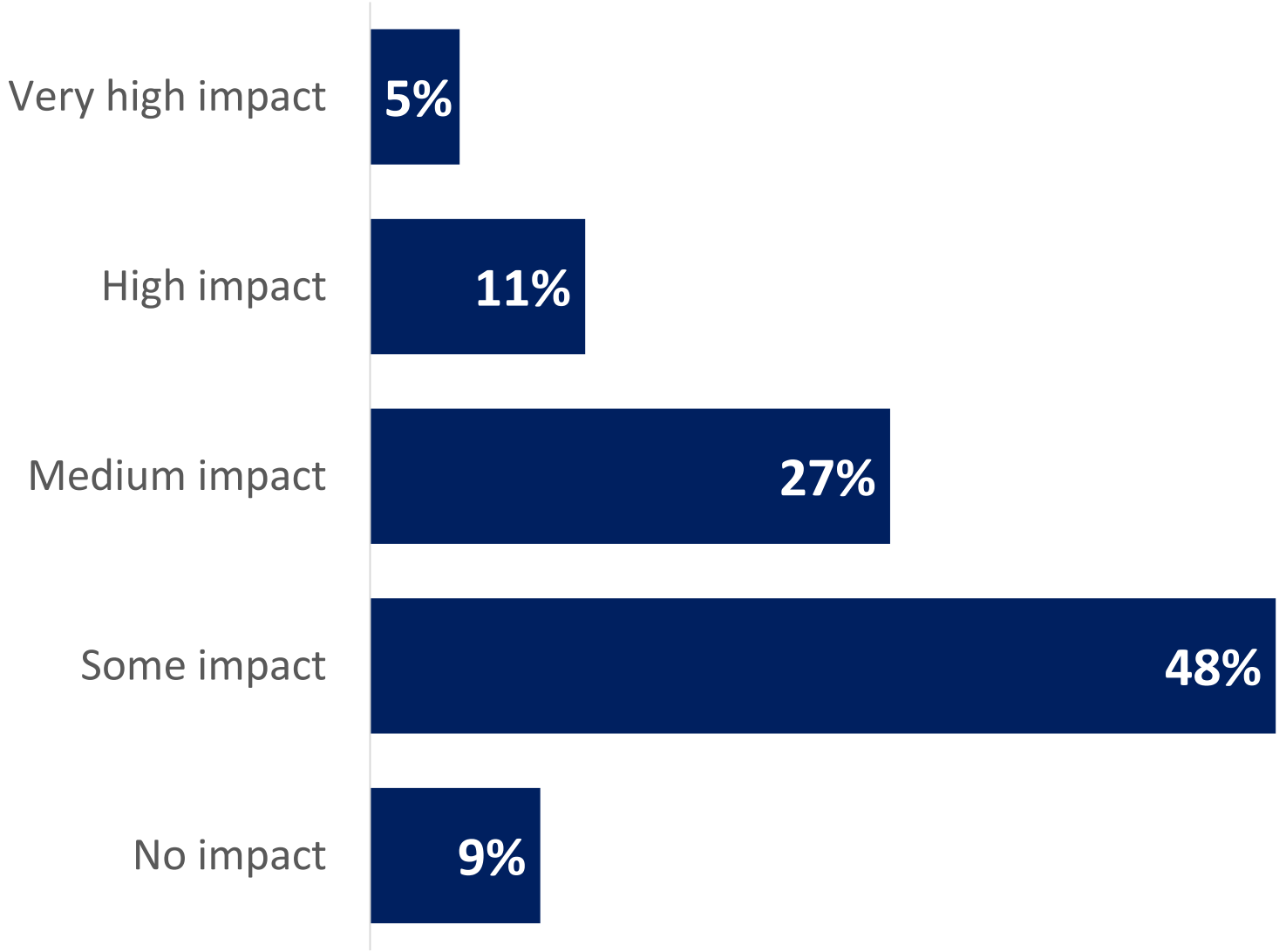
OTHER FACTORS THAT IMPEDE ACHIEVEING DESIGN INTENT

How much do you agree or disagree with each of these statements?



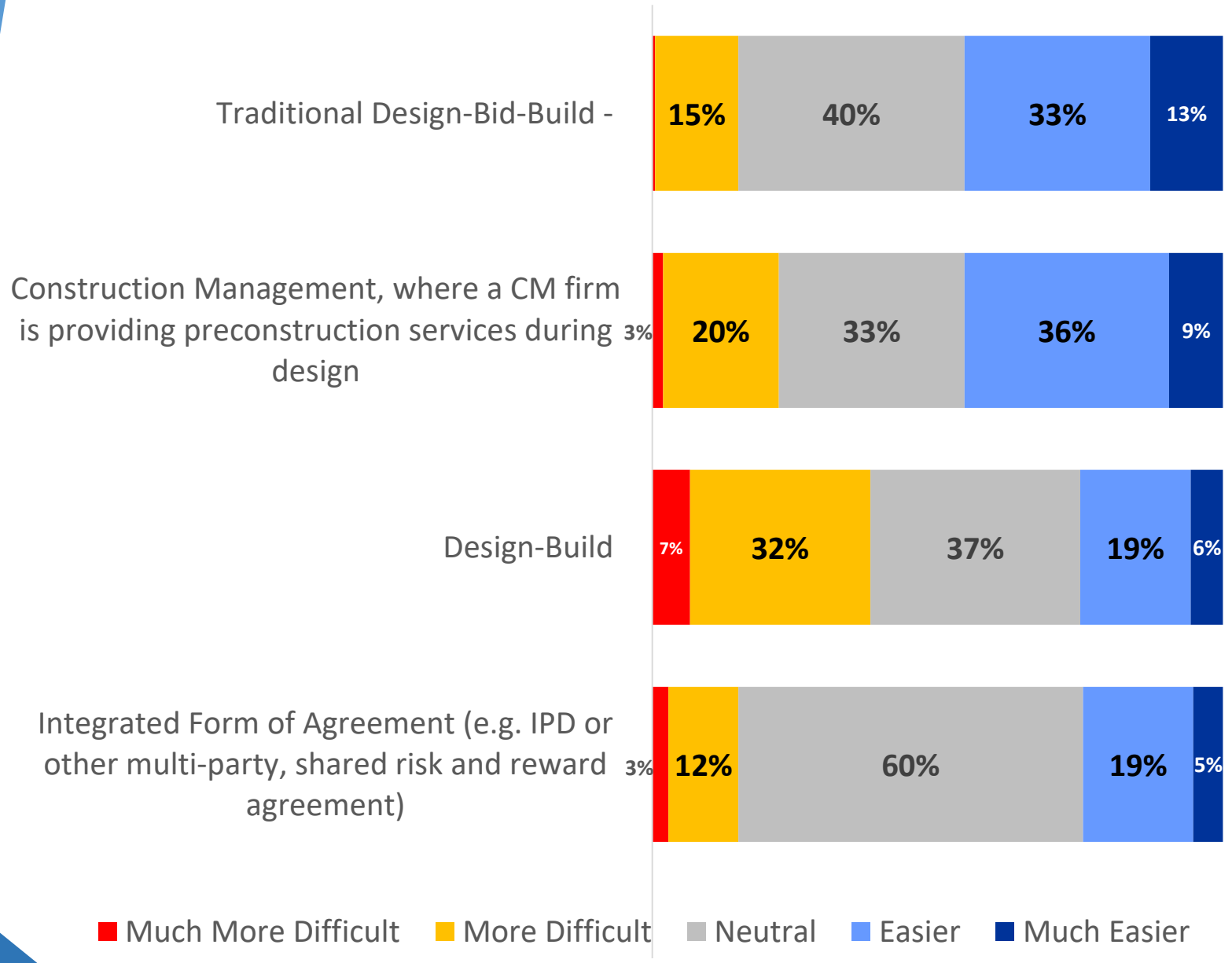
OTHER FACTORS THAT IMPEDE ACHIEVEING DESIGN INTENT

How much impact do the *Authorities Having Jurisdiction* (i.e. local building officials) have on your ability to achieve design intent?

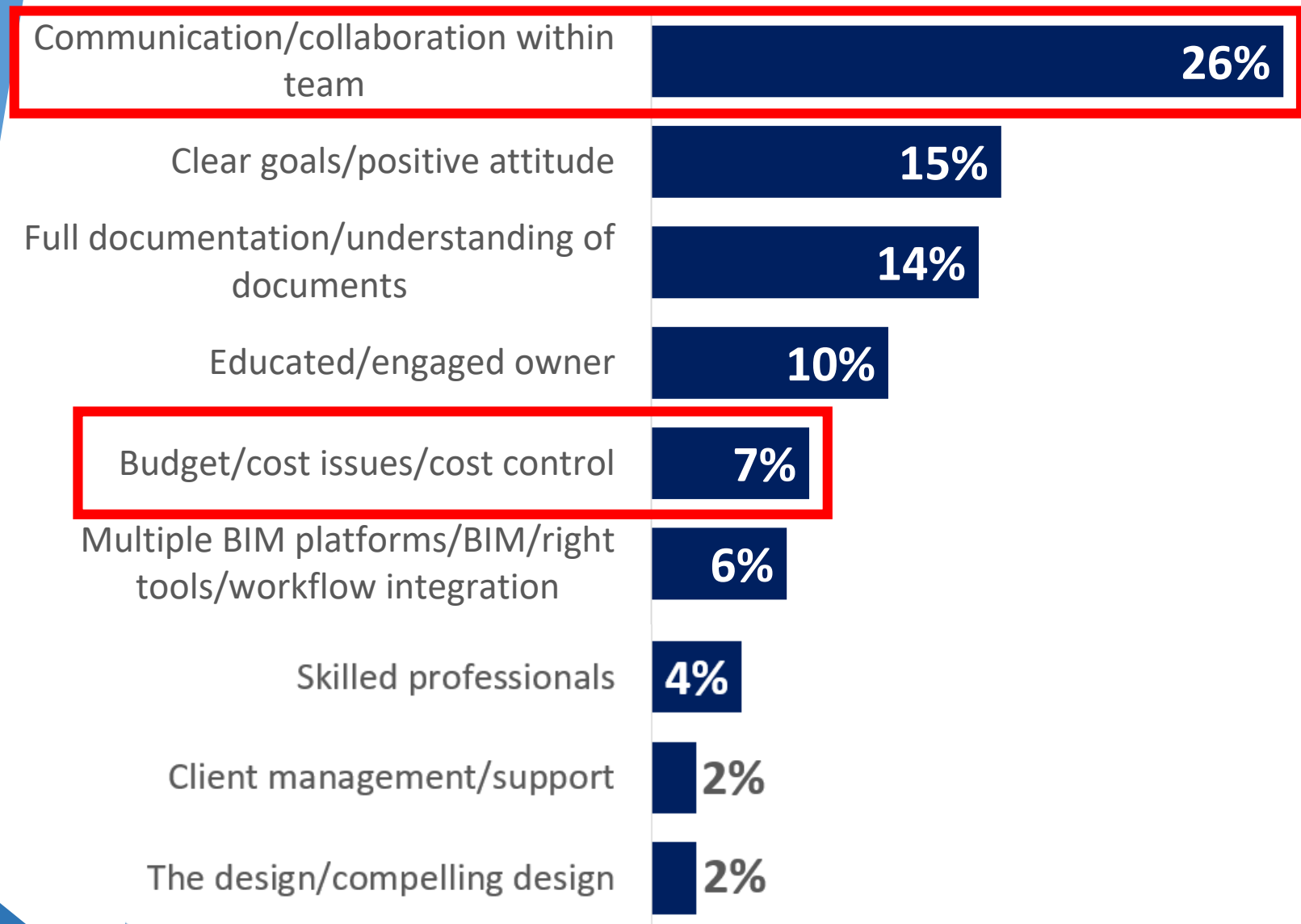


OTHER FACTORS THAT IMPEDE ACHIEVEING DESIGN INTENT

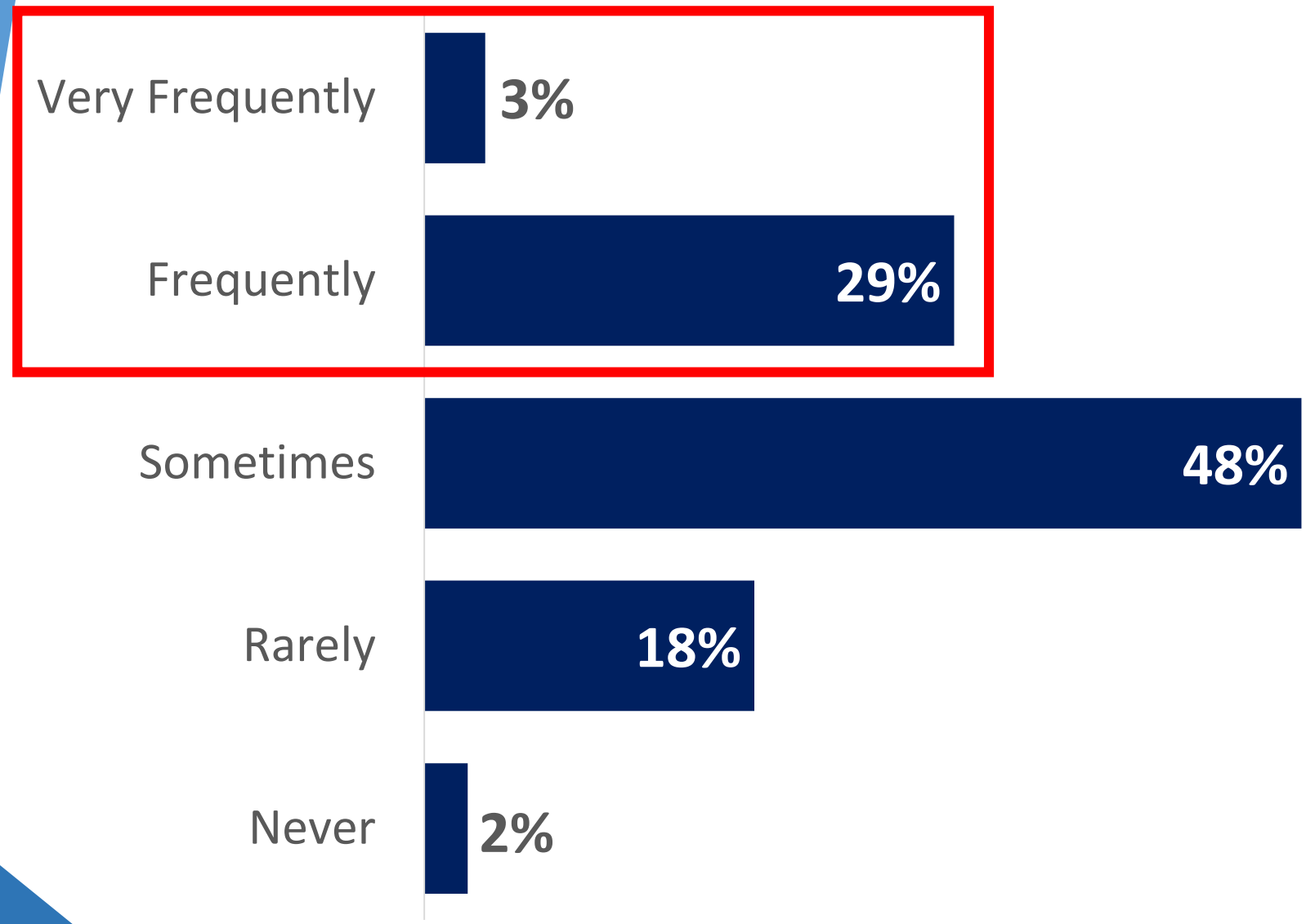
How much impact does the *Project Delivery Model* have on your ability to achieve design intent?



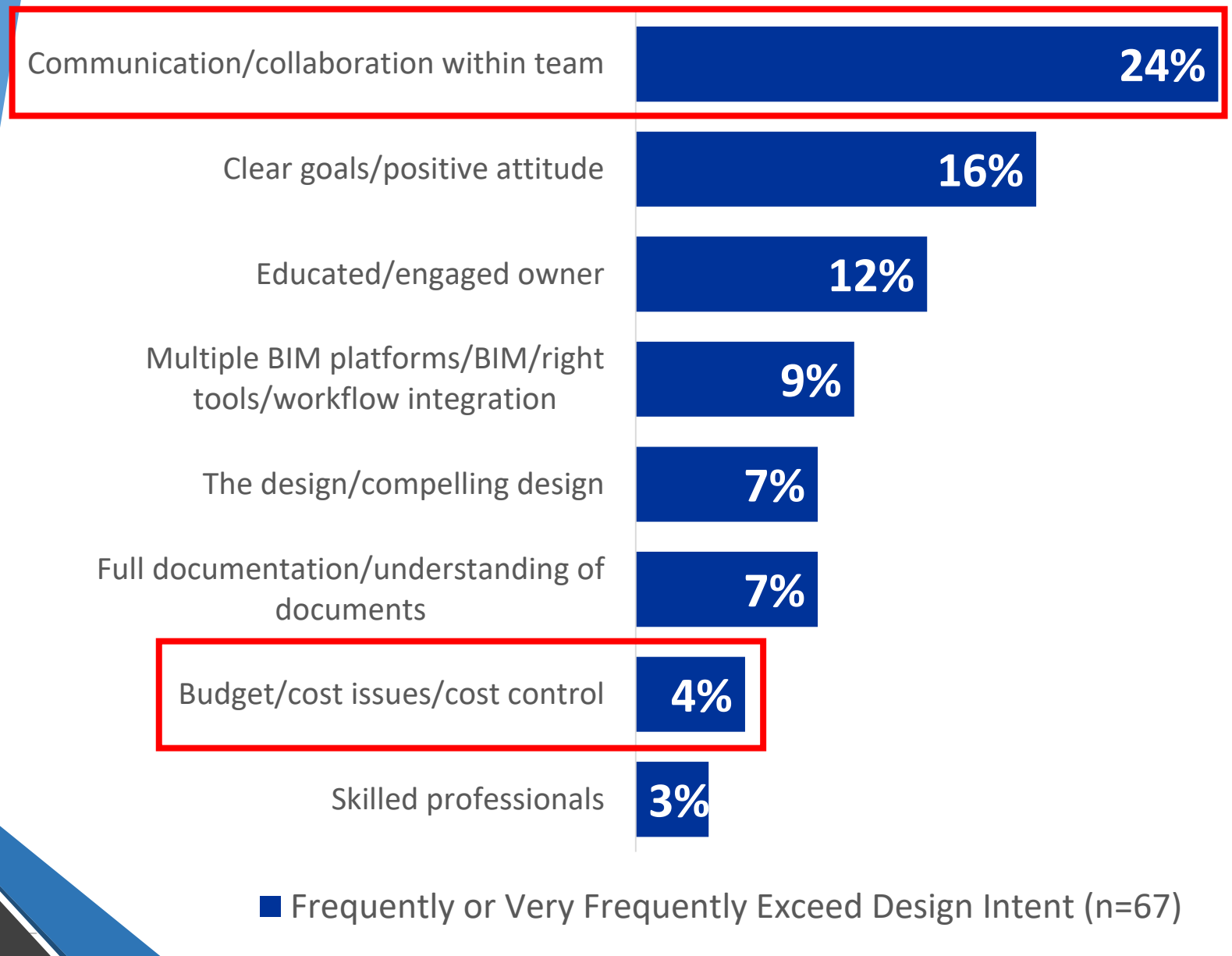
BIGGEST CONTRIBUTOR TO ACHIEVEING DESIGN INTENT ("in a few words" open text responses)



FREQUENCY OF EXCEEDING DESIGN INTENT



BIGGEST CONTRIBUTOR TO EXCEEDING DESIGN INTENT ("in a few words" open text responses)



Agenda

- New research by Dodge Data & Analytics
- Rethinking Construction by Building Catalyst

Reinventing Construction

Starting with
Knowledge-based BIM
(Modeling, Measuring and Management)

Building CATALYST

BOLDT

case technologies inc

Eos GROUP

Mortenson

re:play

RYAN

SHAWMUT

UMSTOT SOLUTIONS

The American Institute of Architects

Project Delivery
an AIA Knowledge Community

The Team

Bruce Carlson
Building Catalyst
Software Development

Tom Case
Replay Destinations
VP Construction

Jayme Couchene
The Boldt Company
Development Director

Mark Dietrick, AIA
Case Technologies
BIM Technology

Doug Heinrich
Mortenson Company
Estimating Director

Scott Jasperse
Building Catalyst
Software Development

Sue Klawans
Consultant
Lean Process

Nick Papadopoulos
Eos Group
President

Mark Sands, PE
Building Catalyst
Data Analysis/Research

Jourdan Trice
Shawmut D and C
Cost Tech Integration

Dave Umstot
Umstot Solutions
Lean Process

Scott Warren
Ryan Companies
VP Preconstruction

The American Institute of Architects

Project Delivery
an AIA Knowledge Community

The Problem

2017 Report - McKinsey Global Institute

… construction appears to be in a time warp. In the United States since 1945, productivity in manufacturing...has grown as much as 1500 percent; productivity in construction has barely increased at all…

Building cost escalation continues to grow two to three times faster than the national inflation rate.

Reinventing Construction

Rethinking Planning to Production

5 Major Shifts

Shift 1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

What is BIM?

National BIM Standard

A BIM is a digital representation of physical and functional characteristics of a facility.

BIM serves as a shared *knowledge resource* for information about a facility forming a reliable *basis for decisions* during its lifecycle from *inception* onward.

Shift 1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

BIM serves as a shared ***knowledge resource*** for information about a facility forming a reliable ***basis for decisions*** during its lifecycle from ***inception*** onward.

Knowledge-based BIM

A BIM is a digital representation of physical and functional characteristics of a facility.

Design-based BIM

Shift 1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

Current State

Feasibility	Program	Design	Document	Procure	Construct	Occupy

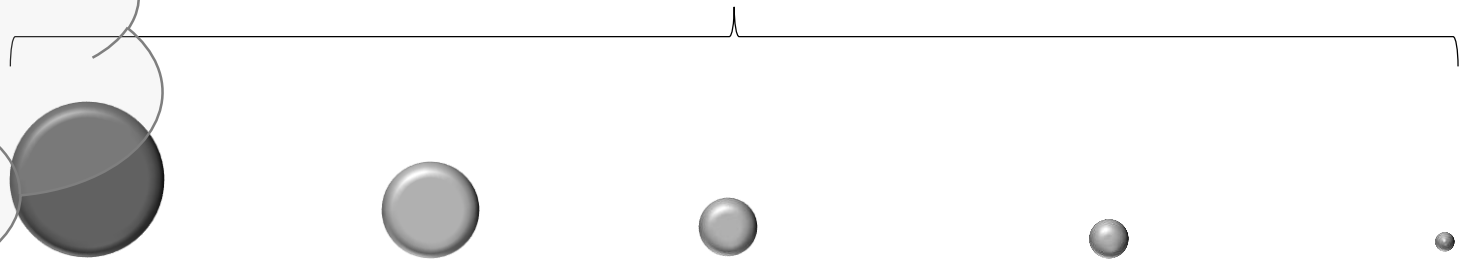
Business Case

Due Diligence

AUTODESK® REVIT®

Design-based BIM, VDC and Cost Management Tools

Knowledge-based BIM **not** Available



Relative Magnitude of Decisions Impacting Outcomes

Shift 1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

Feasibility	Program	Design	Document	Procure	Construct	Occupy
Business Case	Due Diligence					

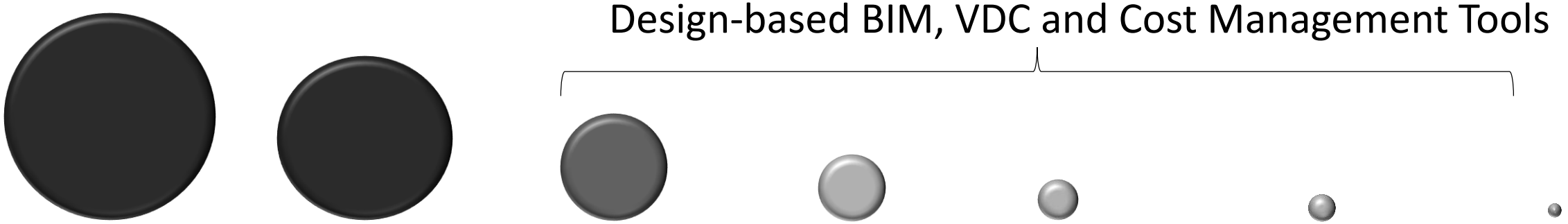
Building CATALYST

Knowledge-based BIM

Proposed State

AUTODESK® REVIT®

Design-based BIM, VDC and Cost Management Tools



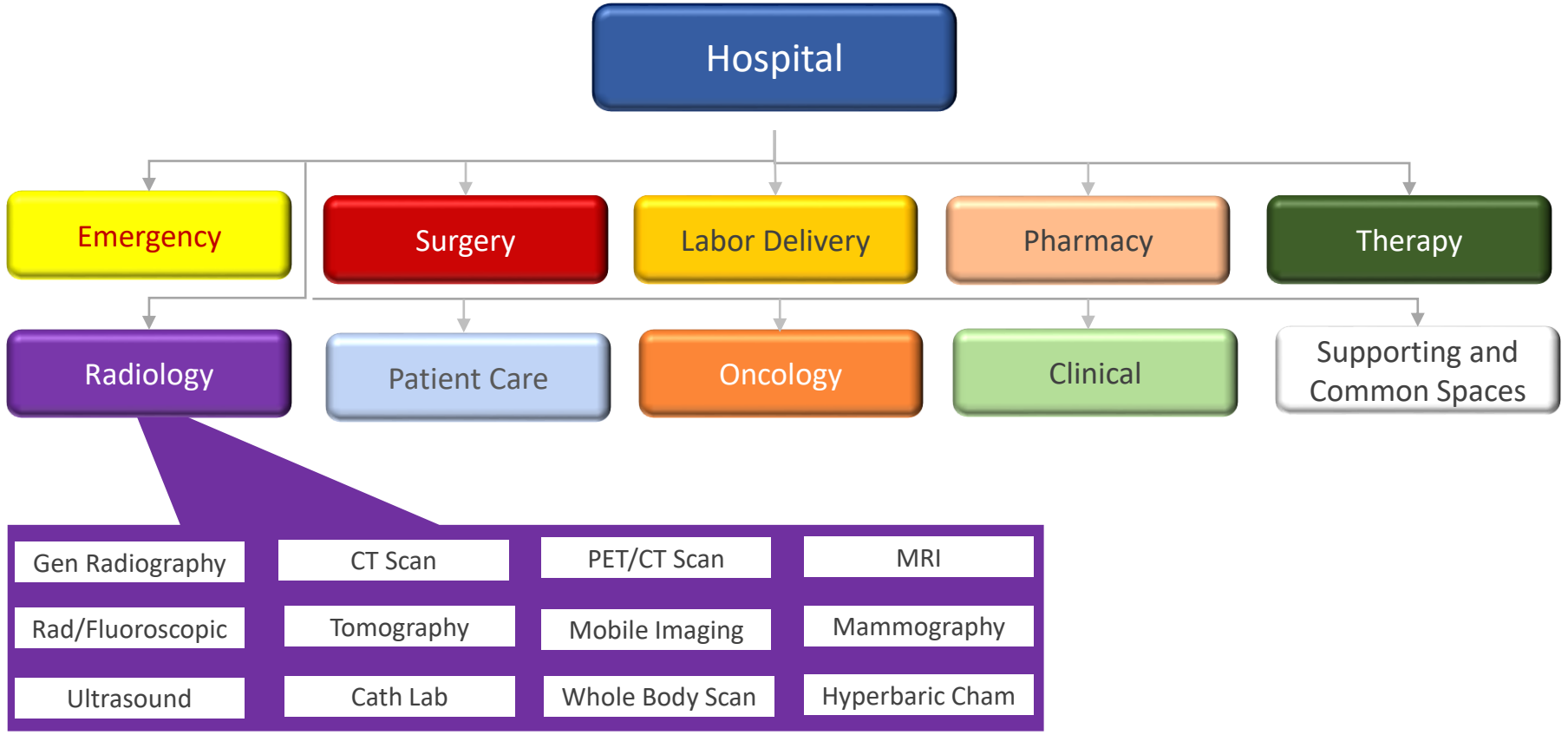
Relative Magnitude of Decisions Impacting Outcomes

Shift 2 – Purpose-driven (AKA Owners Business Case) Planning and Execution

Principle Purpose

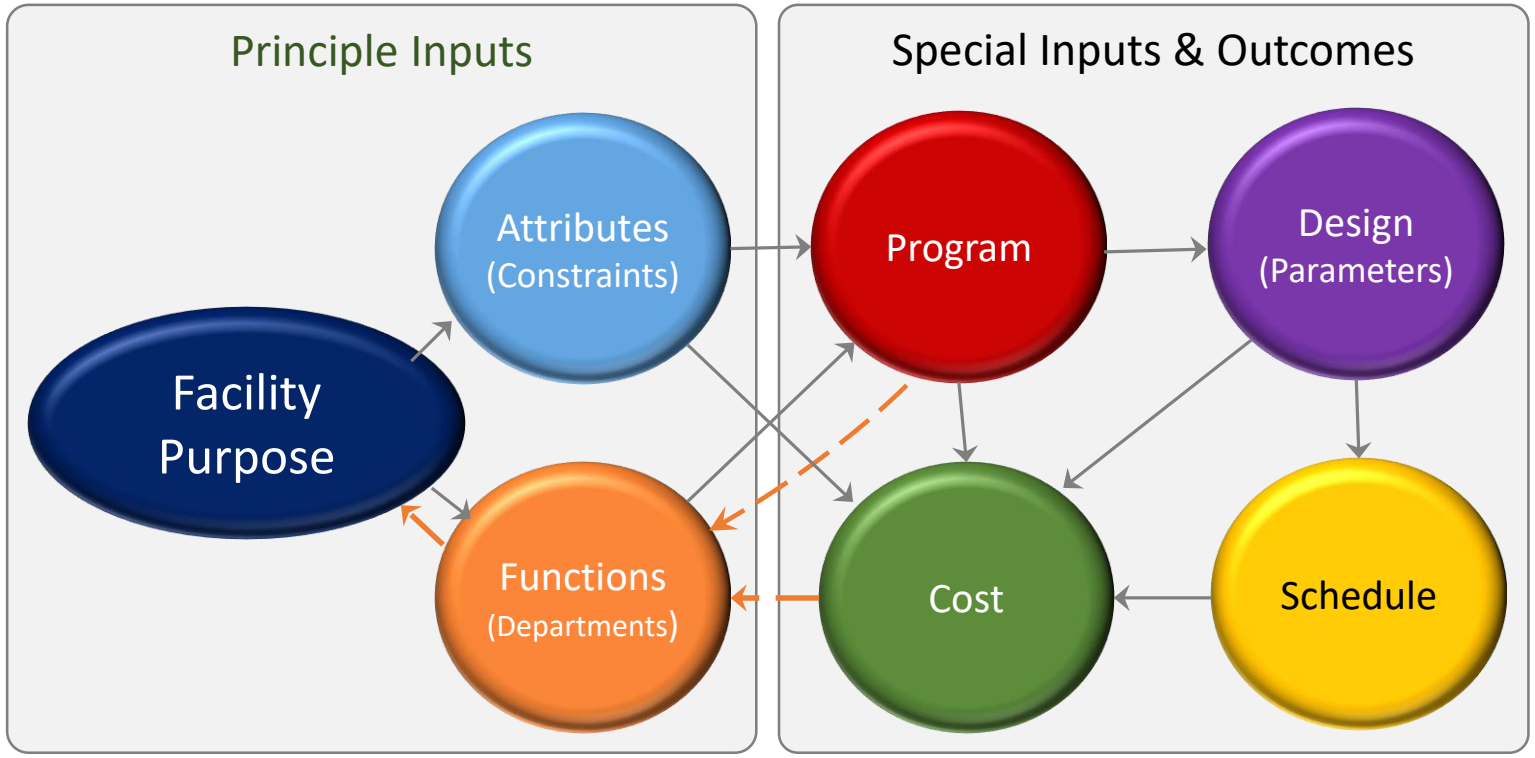
Departments

Functions



Shift 3 – Simple Systems-driven Planning and Execution

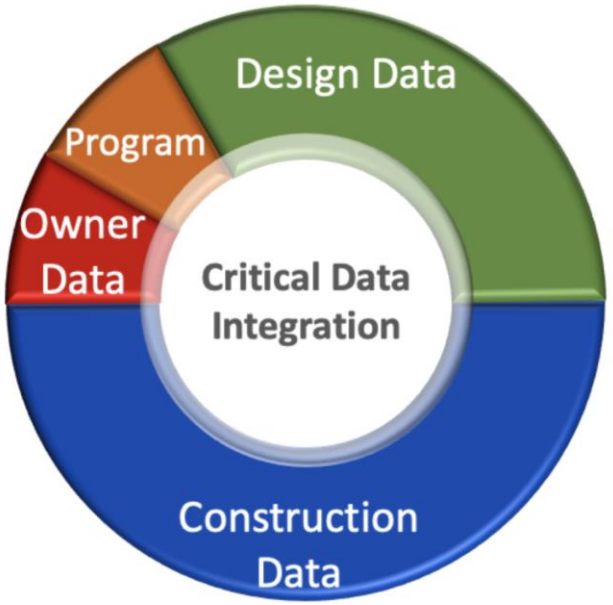
Integrated Project **Data** – then Delivery



Integrated System of Critical Data

Shift 3 – Simple Systems-driven Planning and Design

Current State
Myriads of insular and disconnected data sources

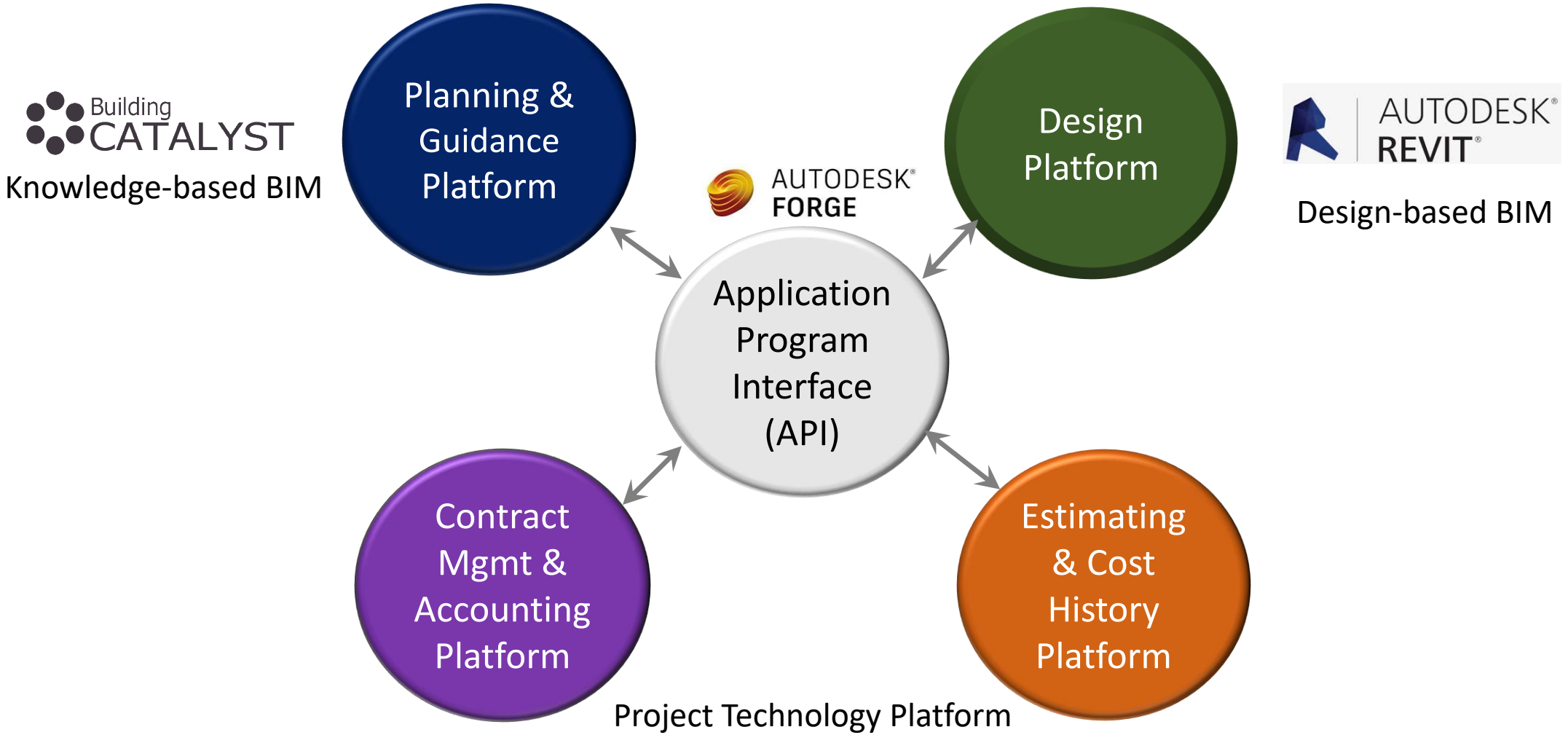


Optimal State
Fully integrated system of critical data

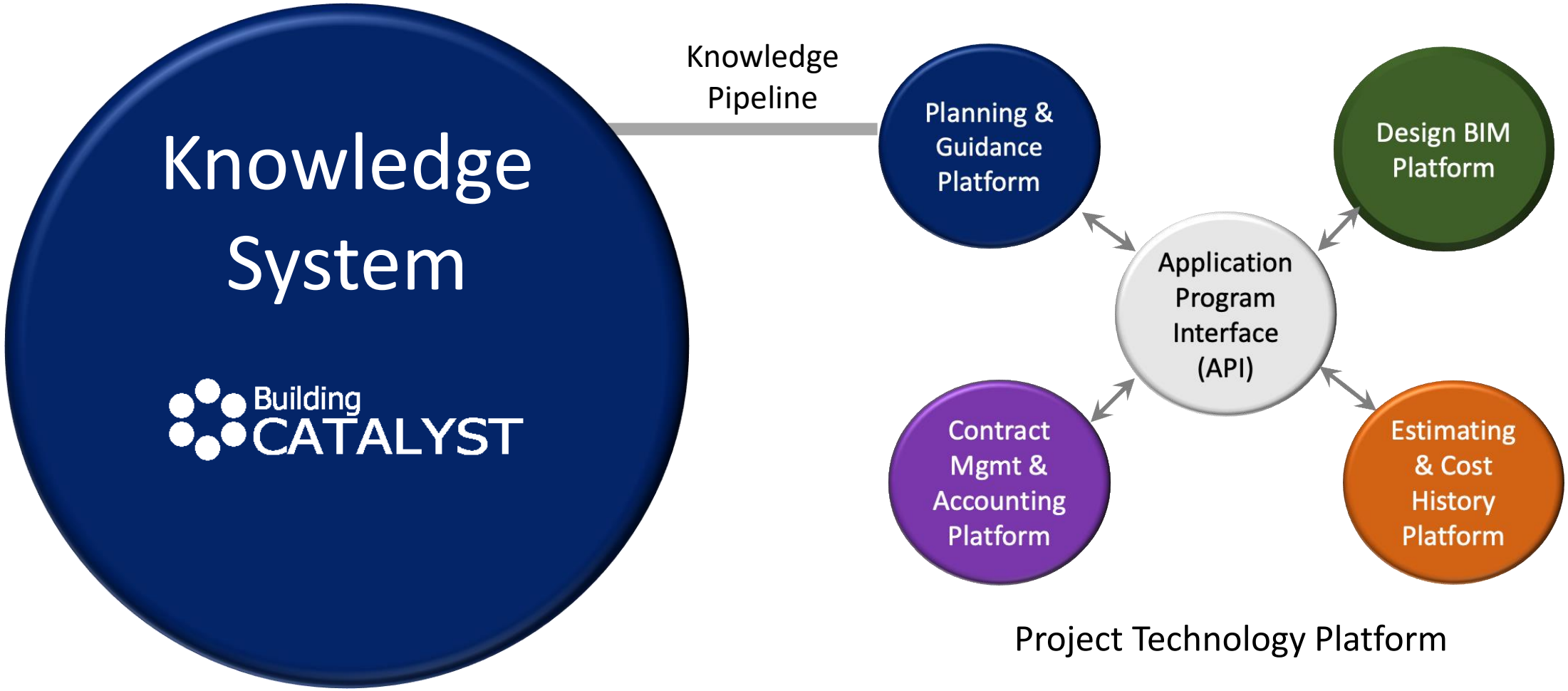
Reinventing the Wheel
On Every Project

Invent Many Wheels, Drive Trains…
One Time… Apply On Many Projects

Shift 3 – Simple Systems-driven Planning, Design and Cost Management



Shift 4 – Industry-wide Knowledge (Big Data) System



Project Technology Platform

Shift 4 – Industry-wide Knowledge (Big Data) System

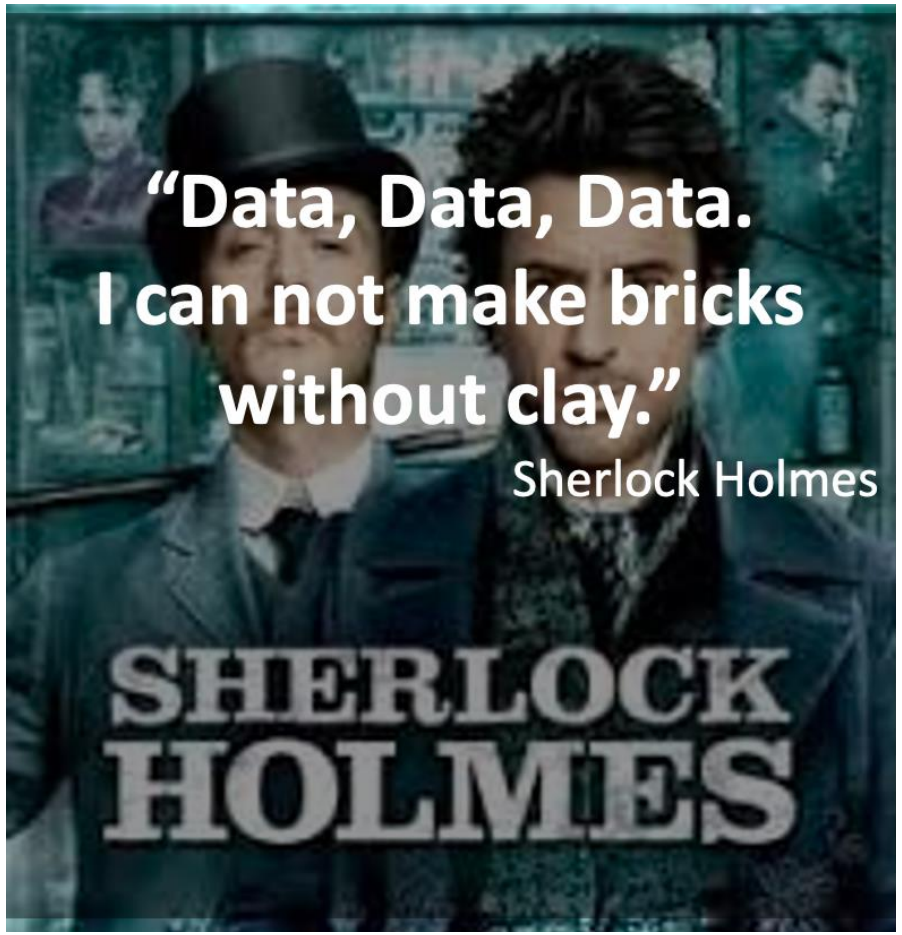
What is Big Data?

Big data is high-volume, high-velocity and/or high-variety information assets

that demand cost-effective, innovative forms of information processing

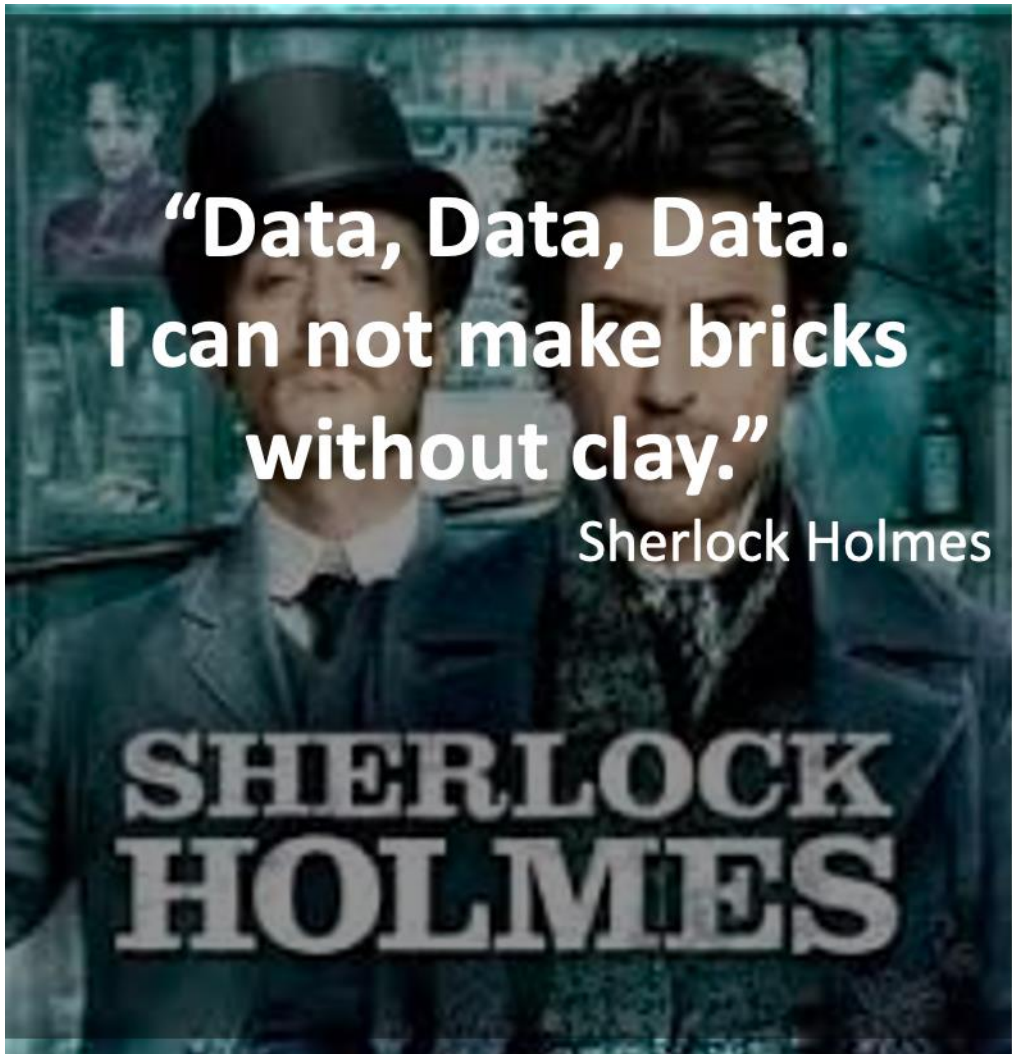
that enable enhanced insight, decision making, and process automation.

Shift 4 – Industry-wide Knowledge (Big Data) System



What does Big Data do for us?

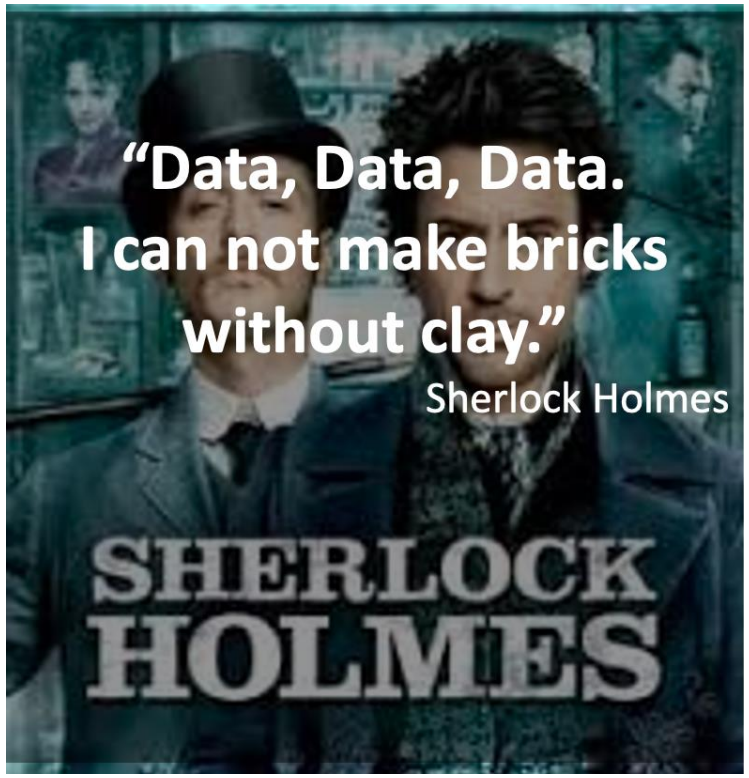
- Project outcomes can be known prior to design
- Rapid, multi-scenario prototypes now inform decision-making and target setting
- A project guidance system insures more certain and optimal results
- A platform for measurement-based process improvement is established

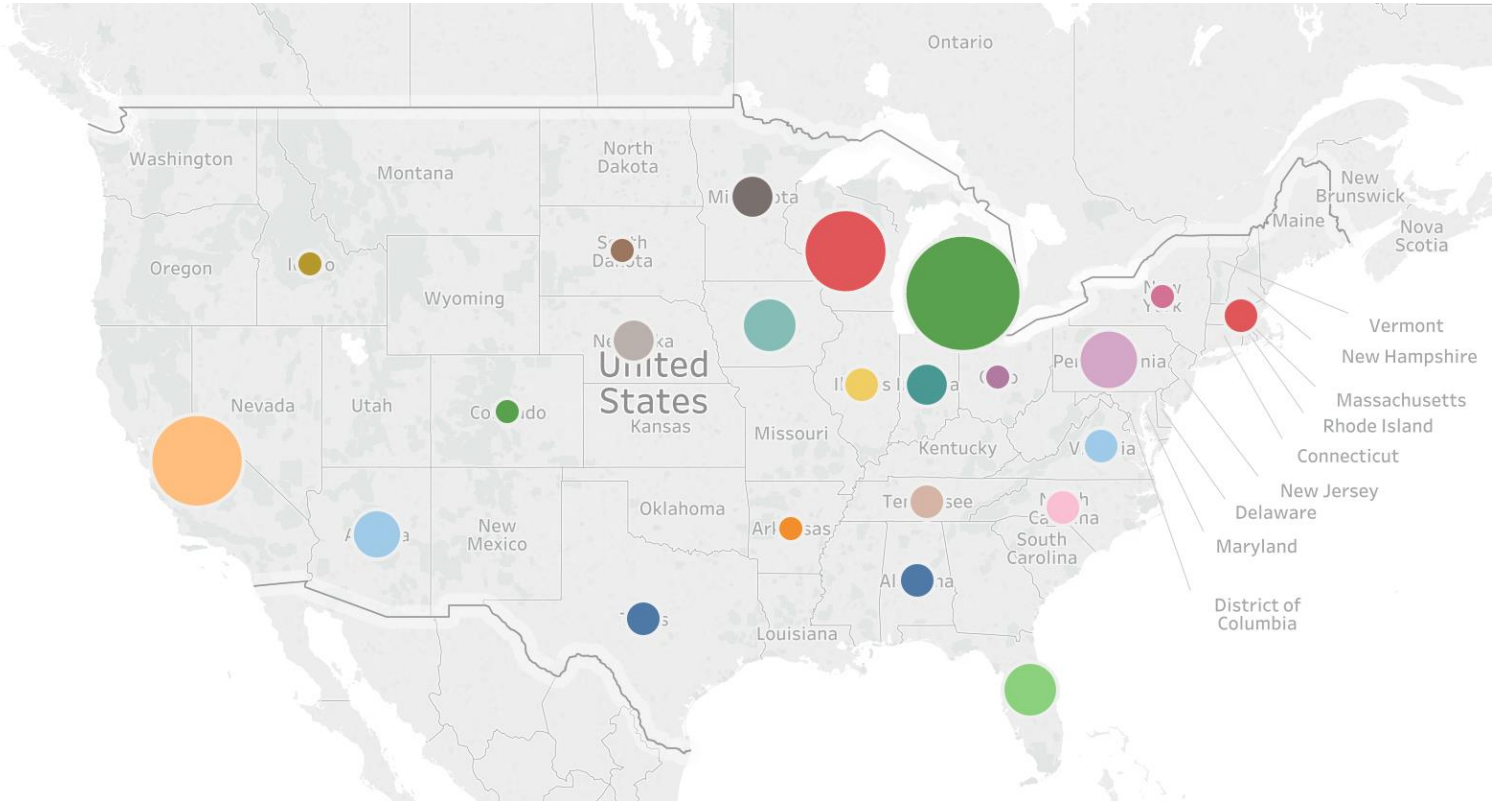


100 Project Data Research Study

100 Project Data Research

23 States



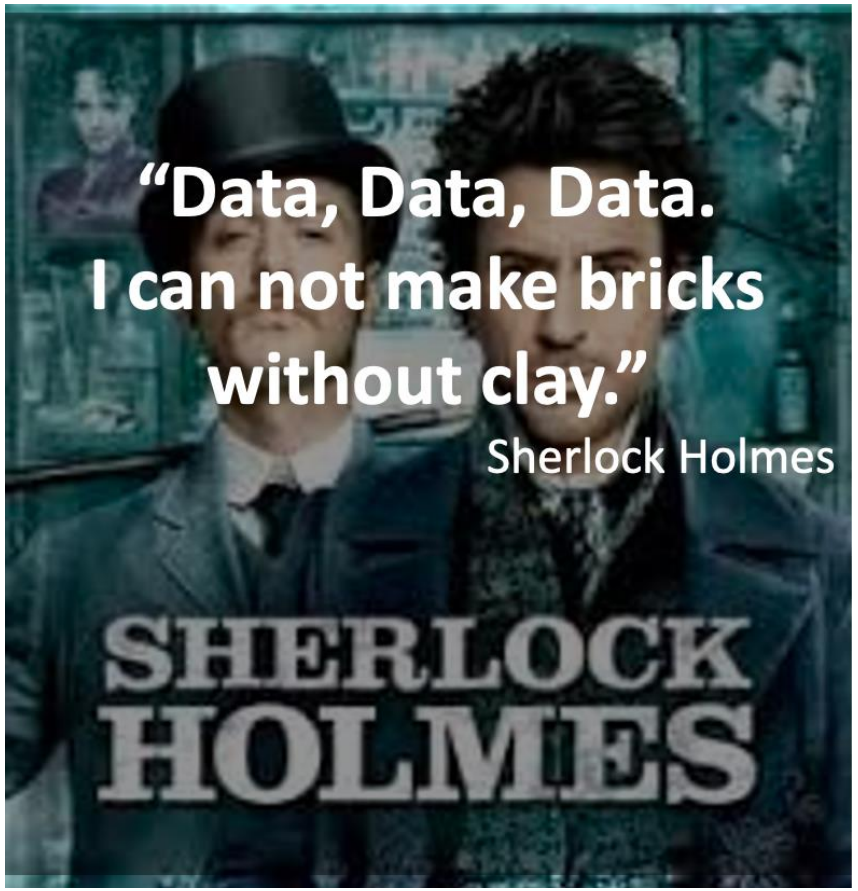


The American Institute of Architects

Project Delivery
an AIA Knowledge Community

100 Project Data Research

20 Builders



AGILIS

BOLDT

Bouma CORPORATION

BRASFIELD & GORRIE GENERAL CONTRACTORS

CHRISTMAN SINCE 1894

CLARK CONSTRUCTION

CSMGROUP

DPR CONSTRUCTION

GRANGER

Hathaway Dinwiddie

mascaro

McCARTHY

NABHOLZ CONSTRUCTION SERVICES

pinnacle

RYAN

RUDOLPH AND SLETTEN

SKANSKA

SOLTEK PACIFIC CONSTRUCTION

TRIANGLE

WEITZ

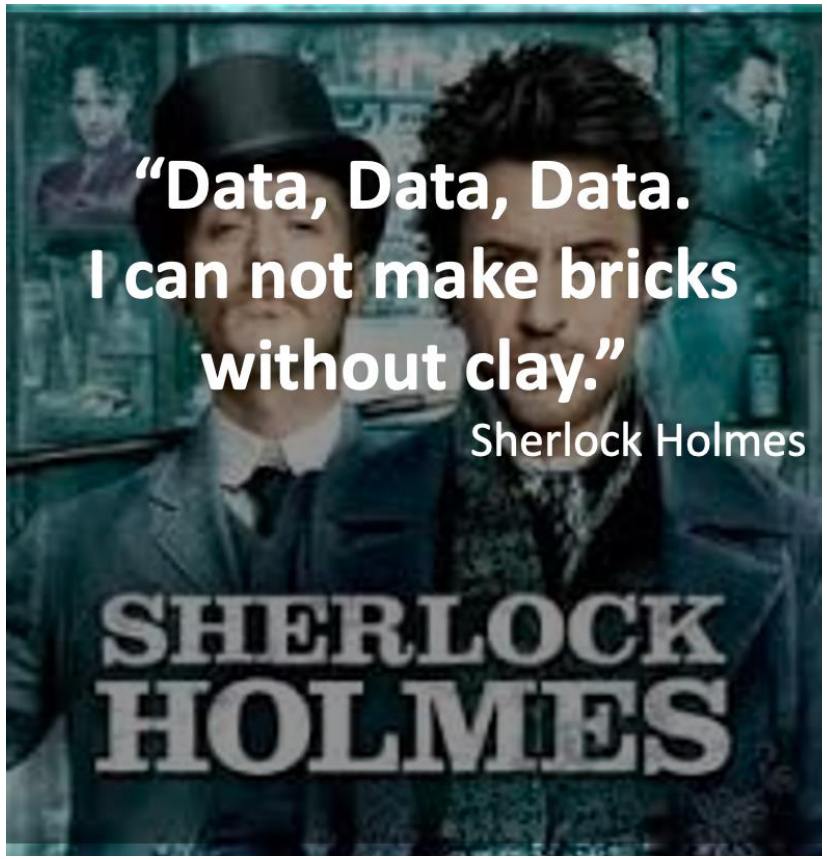
The American Institute of Architects

Project Delivery

an AIA Knowledge Community

100 Project Data Research

10 Categories - 26 Types



H

Hospital
- General
- Critical Access
- Rehabilitation

U

Higher Ed (University)
- College Academic
- College Science
- Research Engineering

H

Hospitality
- Hotel (Full Service

M

Medical (Ambulatory)
- Medical Center
- Medical Clinic
- Medical (Single Practice)
- Cancer Center
- Freestanding Emergency

K

K12 Education
- Elementary School
- High School
- Charter School

I

Industrial
- Manufacturing
- Clean Process
- Warehouse

O

Office
- Office
- Office (Multi-tenant)

R

Multi-unit Residential
- Multi-unit Apartment
- Student Housing
- Senior Living
- Skilled Nursing

D

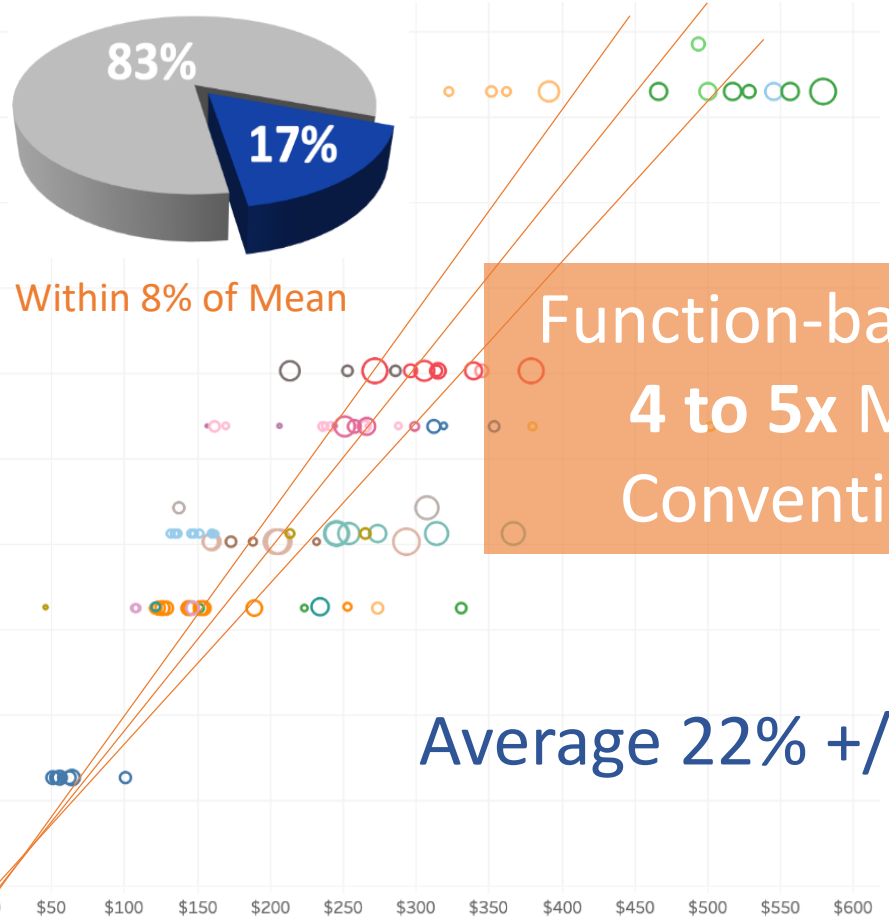
Data Center
- Tier 2 Data Center

P

Parking
- Parking Deck

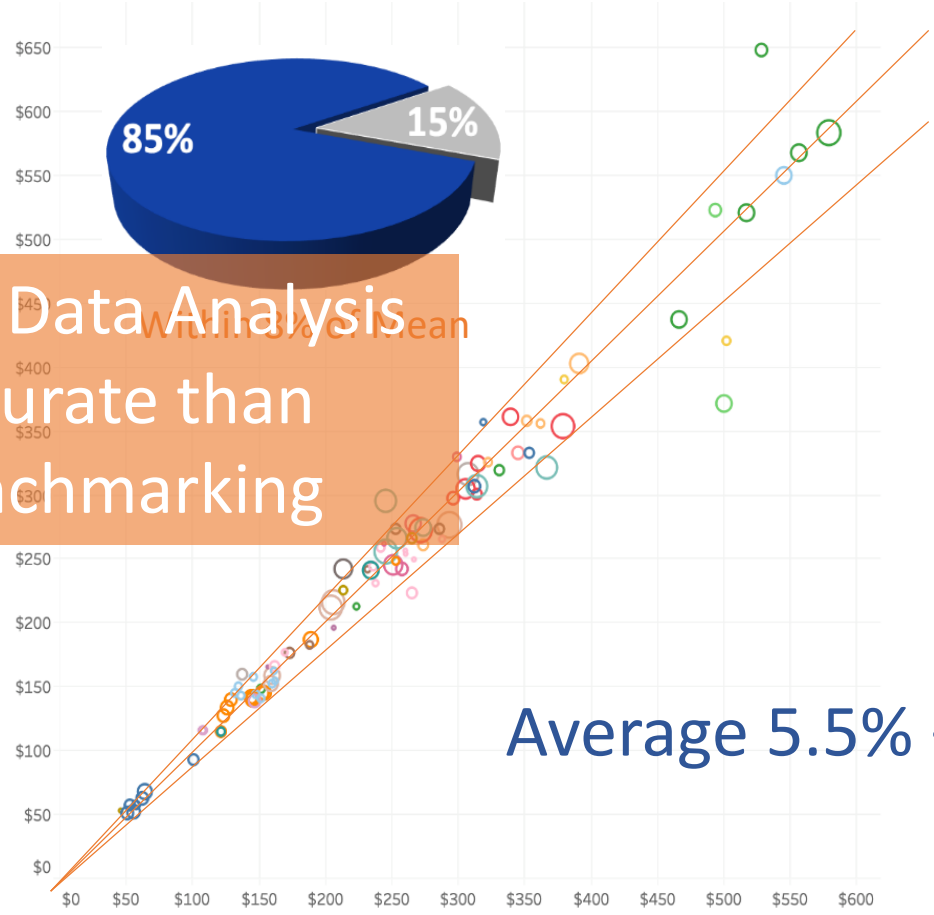
100 Project Research Study Results

Conventional Benchmarking ($/SF across Category)



Average 22% +/-

Function-based Big Data Analysis



Average 5.5% +/-

Function-based, Big Data Analysis
4 to 5x More Accurate than
Conventional Benchmarking

The American Institute of Architects
Project Delivery
an AIA Knowledge Community

Costs normalized to St. Louis, Mo – 2020 Construction Start. Costs for Direct Building Systems - Exclude Sitework and Indirect Costs

Shift 5 –

Realigned Contractual Structures and Incentives

+

Manufacturing-inspired Construction (including integrated supply chain)

2017 Report - McKinsey Global Institute

Principle

Fixing the building production system (Shift 5) requires fixing the planning, design and management system (Shifts 1 thru 4)

Owners Need Architects to embrace the first four shifts

Illustration

Two Rehabilitation Hospitals
Two Different Owners
Two Different Approaches

Rehabilitation Hospital A

Problem: Project Not Feasible if Costs More than $500,000 per bed

Rehabilitation Hospital B

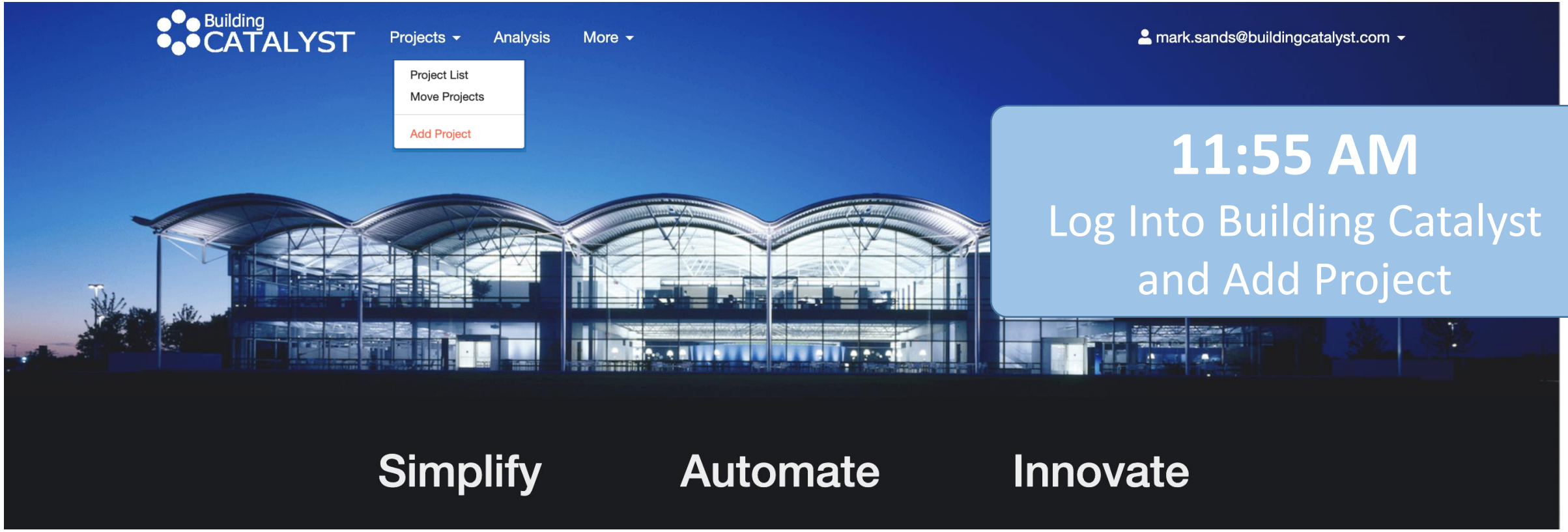
Kent Riddle <Kent.Riddle@maryfreebed.com>
Thursday, October 17, 2019 at 11:35 AM
Mark Sands; Jeff Garber; Randy DeNeff; Ryan Podvin; Lorissa MacAllister
Show Details

You replied to this message on 10/17/19, 12:37 PM. Show Reply

Mark, would it be possible for MFB to design/build (as efficiently as possible) a 100 bed (inpatient only) hospital on a site of our choosing for $500,000 per bed?
Please let me know.
Thanks.

Kent Riddle | *CEO*
Mary Free Bed Rehabilitation Hospital
235 Wealthy St SE Grand Rapids, MI 49503
office: 616.840.8341
fax: 616.840.9654
maryfreebed.com

11:35 AM
Can a 100 Bed Hospital be designed and built for $500,000 per bed?


Building CATALYST
Projects
Analysis
More
mark.sands@buildingcatalyst.com
Project List
Move Projects
Add Project
11:55 AM
Log Into Building Catalyst and Add Project
Simplify
Automate
Innovate

Enter Key Attributes About the Project

Add Project

To add a project, select a category and purpose for the building from the lists below.

Building Category

HEALTHCARE (IN-PATIENT)

Hospital and other In-patient Facilities | Project Counts...

Building Purpose

Hospital (Rehabilitation)

Rehab Hospital with OT/PT/Cardiac Treatment Center

Program Readiness 70% | More...

Calibration Strength 60% | More...

Project Name

100 Bed Rehabilitation Hospital

State

Metro Area

Construction Start Year (YYYY)

2021

Month

May

Total Floor Count

2

Floors Below Main Floor

Templating | More...

Broad Selection of Rehabilitation Programs

- (Please Select)
- ✓ HEALTHCARE (IN-PATIENT)
- HEALTHCARE (AMBULATORY)
- HIGHER EDUCATION
- K12 EDUCATION
- DATA CENTER
- COMMERCIAL
- HOSPITALITY
- RESIDENTIAL
- INDUSTRIAL
- GOVERNMENT
- PARKING
- PUBLIC ASSEMBLY/ACTIVITY
- PRIVATE ASSEMBLY/ACTIVITY
- RETAIL & SERVICES
- SPECIAL PROJECTS

- (Please Select)
- Hospital
- Hospital (Critical Access)
- ✓ Hospital (Rehabilitation)
- Behavioral (In-patient) Care Center

Select/Enter Depts and Functions (Owners Business Case)

Functional Program

Revisions considered "Actual or Target" instead of "Approximate"

- In-patient Floor — 7 — 0 SF
- Out-patient Therapy — 8 — 0 SF
- Clinic — 2 — 0 SF
- Orthotics and Prosthetics — 3 — 0 SF
- Therapy Garden
- Food Service
- Dining
- Under-building Parking

+ Add Program Group

Patient Floors — 5 — 69,790 SF

Description (optional)

Bed (Private Rehab)	Beds: 100	58,620 SF
Active Daily Living	Each: 2	1,950 SF
	24	3,650 SF
	t Units: 20	5,170 SF
	t Units: 2	400 SF

In Patient Rehabilitation Care

Area includes patient room, bath, nurse station, toilets, waiting, administration, storage, and other support areas, and corridors. Area excludes corridors, elevator lobby outside of the department, as applicable (See Core and Common Spaces).

Bed (Private Rehab)

Enter number of beds

Better Known As

Enter Bed Count

Returns Dept Area

Beds 100 Calculated Area 58620 Revise

Confirm/Revise other important Attributes

Definitions

Owner Type
(•) Private ( ) Federal ( ) State ( ) Local/Public ( ) Custom Franchise ( ) Non-Profit

Location Type
( ) Dense Urban ( ) Urban (•) Suburban/Residential ( ) Rural ( ) Campus

HVAC Generation Approach
( ) Unknown ( ) Prepackaged RTU (DX) ( ) Central Generation & Air Handing (•) Central Generation with Roof Top Air Handling
( ) Utility Connection with Central Air Handling ( ) Utility Connection wi
( ) Geothermal with Central Air Handling ( ) Geothermal with Roof Top
( ) Unitized (Residential/Lodging) System ( ) Not Applicable

Development Stage
(•) Early Planning ( ) Programming ( ) Conceptual Design ( ) Scher
( ) Procurement (Bought Out) ( ) Final Completion

Scope Exclusions
[ ] Sitework [ ] Monumental Sign [x] Communication Systems [ ] S
[ ] Window Coverings [ ] Appliances

Indirect Services

	Exclude	Direct Cost % Baseline	Revised	
General Conditions	[ ]	8.00 %		%
Permits, Insurance and Bonds	[ ]	1.50 %		%
Construction Fee	[ ]	4.00 %		%
Contingency	[ ]	5.00 %		%
Design (Architecture and Engineering)	[x]	8.00 %		%

Standards

Quality Classification
( ) Unknown ( ) Economic Grade ( ) Standard (Medium) Grade (•) Standard (High) Grade ( ) Premium (High) Design Grade
( ) Iconic, Monumental Grade

Energy/Environment
(•) NA ( ) LEED Certified ( ) LEED Silver ( ) LEED Gold ( ) LEED Platinum

Continuity of Operations
( ) Life Safety ( ) Critical Systems Only (•) Facility Operational ( ) Full Redundancy

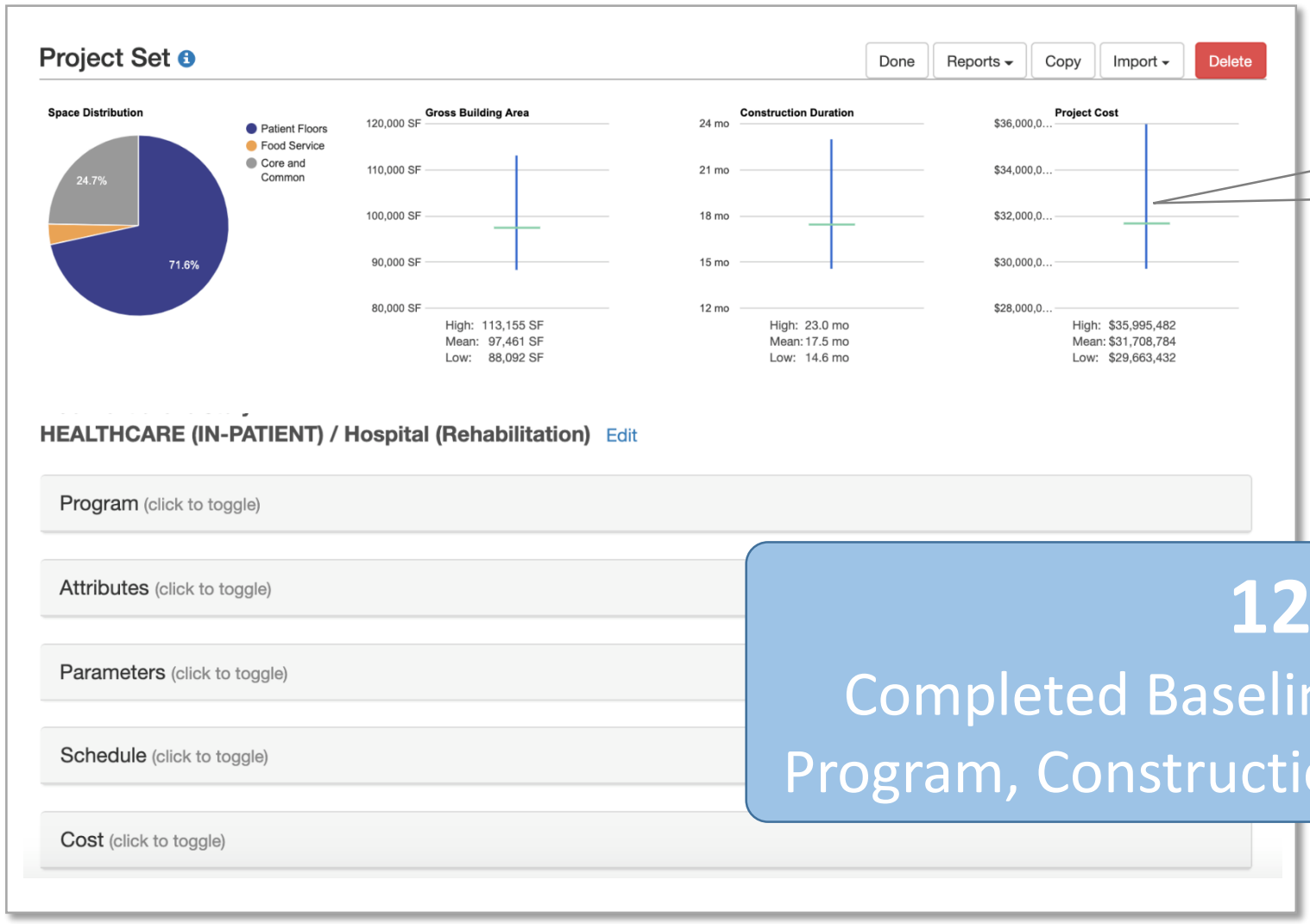
Seismic Design Class
(•) None ( ) SDC A ( ) SDC B ( ) SDC C ( ) SDC D/E

Security Provision
( ) No Security ( ) Building Access (•) Select Security ( ) Full Security

Is Hurricane Design
(•) No ( ) Yes

Special Site Requirements
(•) Unknown ( ) Low ( ) Average ( ) Above Average ( ) High ( ) Not Appilcable

Foundation Bearing Condition
( ) Unknown (•) Ideal Bearing Conditions ( ) Medium Bearing Conditions ( ) Poor Bearing Conditions ( ) Not Applicable



Low: $29,663,432
Mean: $31,708,784
High: $35,995,482

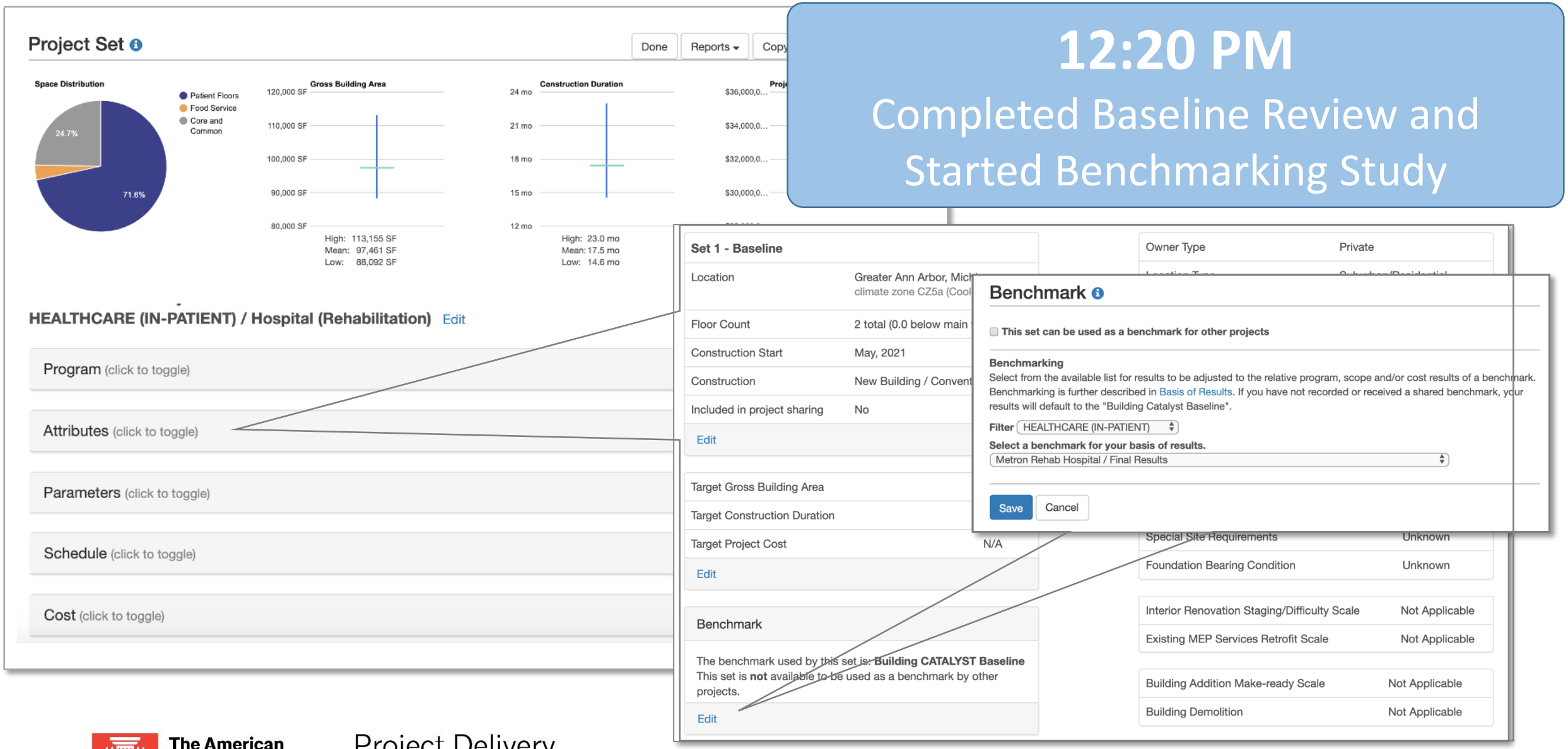
$300K to $360K Per Bed

12:10 PM

Completed Baseline Prediction of Building Program, Construction Duration and Hard Cost

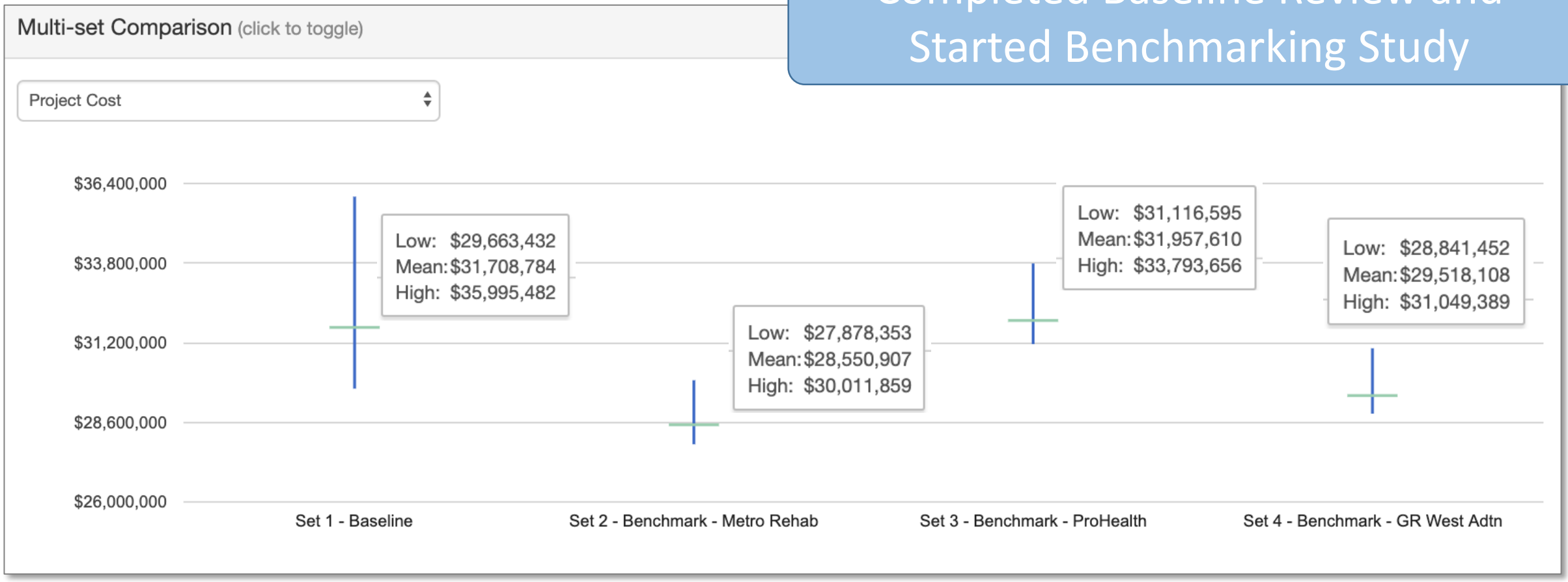
12:20 PM

Completed Baseline Review and Started Benchmarking Study



12:20 PM

Completed Baseline Review and Started Benchmarking Study

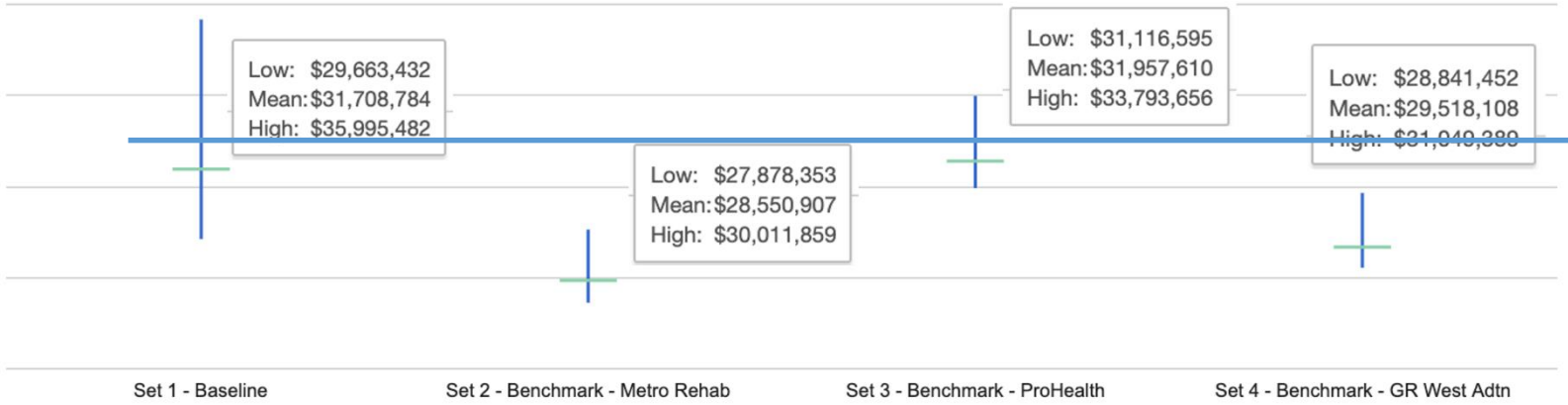


Mark Sands <msands@agilis.build>
Thursday, October 17, 2019 at 12:37 PM
Kent Riddle; Jeff Garber; Randy DeNeff; Ryan Podvin; Lorissa MacAllister
Show Details

You replied to this message on 10/17/19, 12:43 PM.

Hi [redacted],

With associated on-floor therapy – the hard cost (site and building) would be about $330,000 per bed – starting Q1 2021.



Mark S. Sands, PE
616-291-1266 | msands@agilis.build
AGILIS
AGILE Integrated Solutions
The Science of Winning in Construction
agilis.buildingcatalsyt.com

12:37 PM
Hard Cost would be about $330,000 per bed

$33,000,000

Rehabilitation Hospital B

Rehabilitation Hospital B

The Tragedy of the Lack of Knowledge

Rehabilitation Hospital B

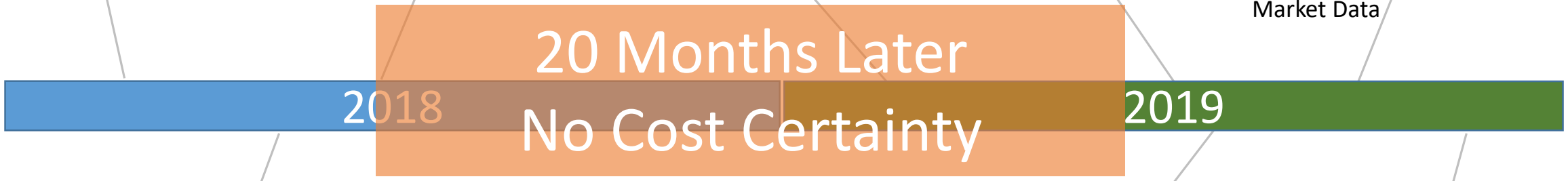
March 2018 Feasibility
6 Options
Arch A vs. Market Data
Net to Gross – 30 to 50% Below
Total Gross – 8 to 17% Below
Unit Cost - 9 to 25% Above

June 2018 Update
Reconciled to Market Data
Building Area within 2%
Unit Cost within 10%

March 2019 Approved
Budget and Project

July 2019
Architect B Proposes Building Area
30% above Market Data

September 2019
Consultant A + Proposing CM's
Budget – 25% to 50% Above
Market Data



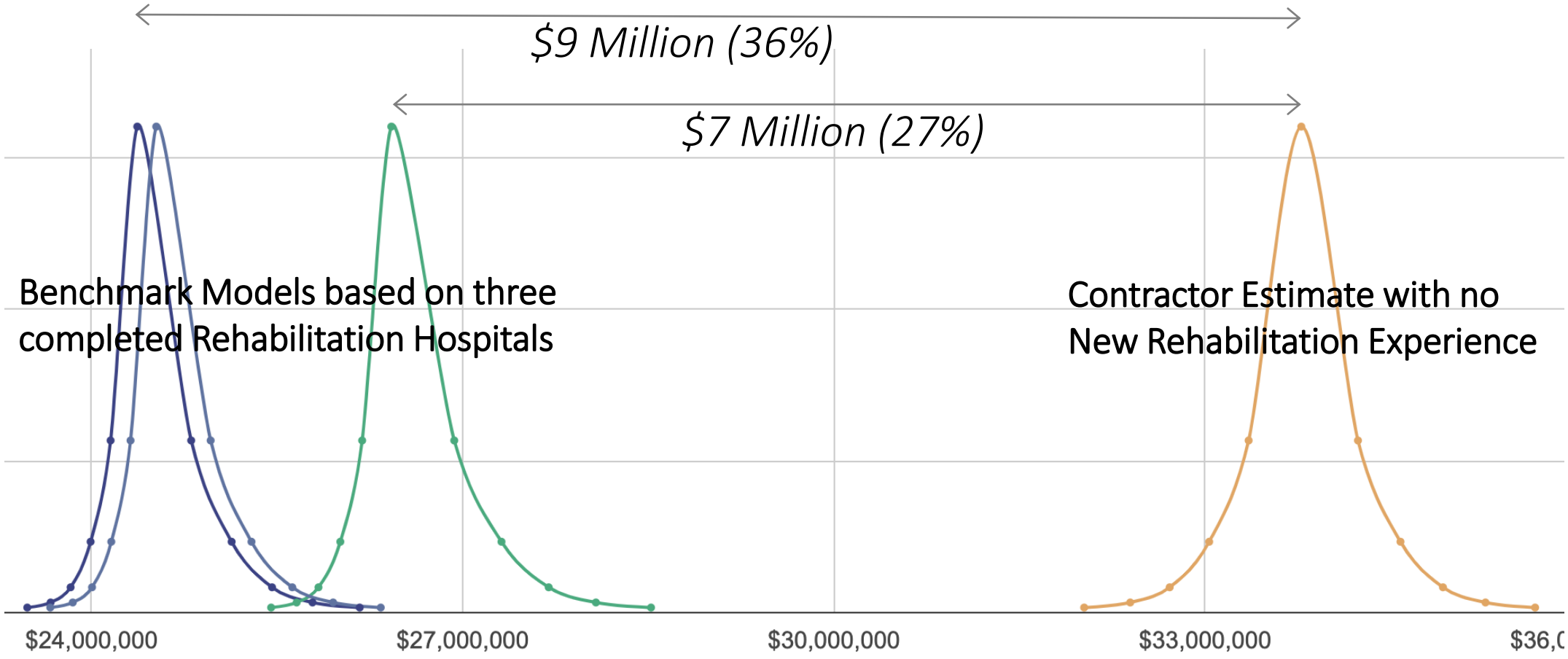
May 2018 Update
Consultant A -
Confirms Market Data
But Proposes Unit Cost - 33% Above

August 2019
Architect B Issues Schematic
Plan per Market Data

November 2019
Proposing CM's Budget Estimate
– 27% to 36% above Market Data

Rehabilitation Hospital B

Schematic Design Cost Model v. Estimate



Two Rehabilitation Hospitals

A: 20 Months (14,400 Hours) – No Cost Certainty

B: 1 Hour – High Cost Certainty

99.99% Time Reduction

5 Major Shifts to Reinventing Construction

1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

2 – Purpose-driven (AKA Owners Business Case) Planning and Execution

3 – Simple Systems-driven Planning and Execution

4 – Industry-wide Knowledge (Big Data) System

5 – Realigned Contractual Structures and Incentives **+** Manufacturing-inspired Construction

5 Opportunities for Architects and Builders

1 – Front End, Knowledge-based BIM (Model, Measure & Manage)

2 – Purpose-driven (AKA Owners Business Case) Planning and Execution

3 – Simple Systems-driven Planning and Execution

4 – Industry-wide Knowledge (Big Data) System

5 – Realigned Contractual Structures and Incentives **+** Manufacturing-inspired Construction

1. Higher Value for Owner
2. Reduced Effort and Time to Deliver
3. More Spectacular Design Afforded
4. Significant Risk Reduction
5. Substantial Increase in Return on Effort

Welcome to the Knowledge Movement

Testimonials

BOLDT

Jayme Couchene

Development Director

"Building Catalyst is addicting"

"On multiple occasions, I've been asked if I was a medical planner"

SHAWMUT

Jourdan Trice

Cost Modeling and Technology Integration Manager

"How can I buy into this company?"

Ron Simoneau

VP Higher Education

"This is exactly what we need. This is fantastic."

RYAN

Scott Warren

VP Preconstruction

"We have to move in this direction. Technology is the key to our future."