



# The Next BIM Generation

Fulfilling the Original BIM Vision

## National Institute of Building Sciences

Provider Number: G168

### The Next BIM Generation

*Fulfilling the Original BIM Vision*

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January 9, 2017





# Moneyball For Construction

**BIM is becoming for Construction  
what Moneyball became for Baseball**



## Moneyball for Construction Purpose?

- *Reliably Predict Outcomes*
- *Manage to More Certain Outcomes*
- *Reduce Conflict, Waste and Defects*
- *Drive Higher Performance, Improve Value*

*This is also BIM's Purpose*





## What is BIM?

A digital representation of physical *and* *functional* characteristics of a facility



## What is BIM?

A digital representation of physical *and* *functional characteristics* of a facility



The Facility Aim or Purpose



What do a facility's functional characteristics look like?

**Hospitals → AIM: Healing**

*Emergency*

*Diagnostics*

*Surgery*

*Labor and Delivery*

*In-patient Care*





What do a facility's functional characteristics look like?

**Education → AIM: Learning**

*Core Academic*

*Science*

*Art and Music*

*Physical Education*

*Vocational Training*





What do a facility's functional characteristics look like?

**Seniors Living → AIM: Caring for Aged**  
*Independent Living*  
*Assisted Living*  
*Memory Care*  
*Skilled Nursing*  
*Hospice Care*





Is today's BIM really a digital representation of a facility's functional characteristics?

*Not Really!*



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BIM intended to be much more

*...a shared knowledge resource of information about a facility forming a reliable basis for decisions during its life cycle; from inception, onward*



# Original BIM Vision

- *Digital Representation*
  - *Physical Characteristics*
  - *Functional Characteristics*
- *Knowledge Resource*
  - *Life Cycle Decision Making*
  - *Decision Making from Project Inception*

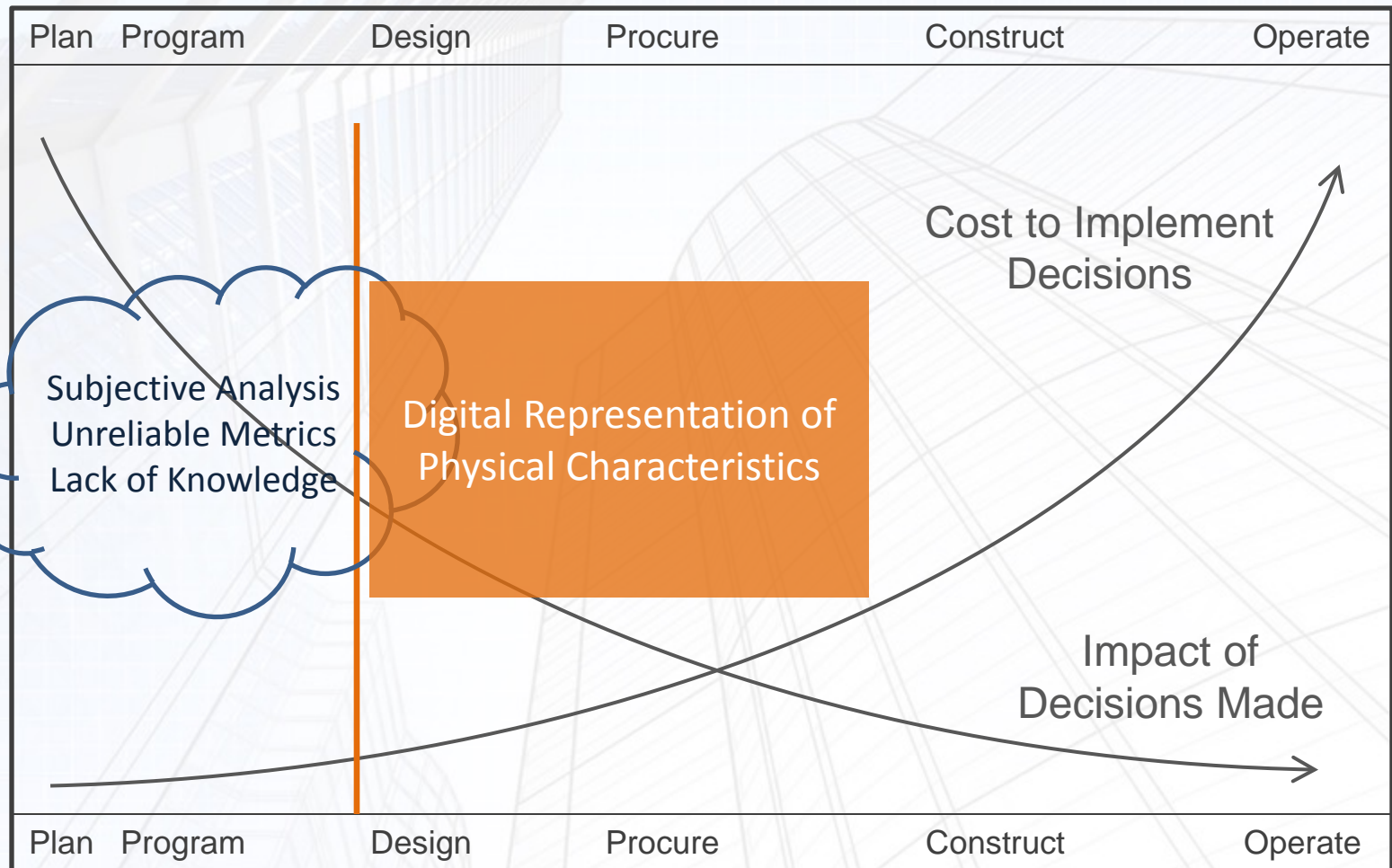
>90% of Today's  
BIM Practice





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Fulfilling the Original BIM Vision



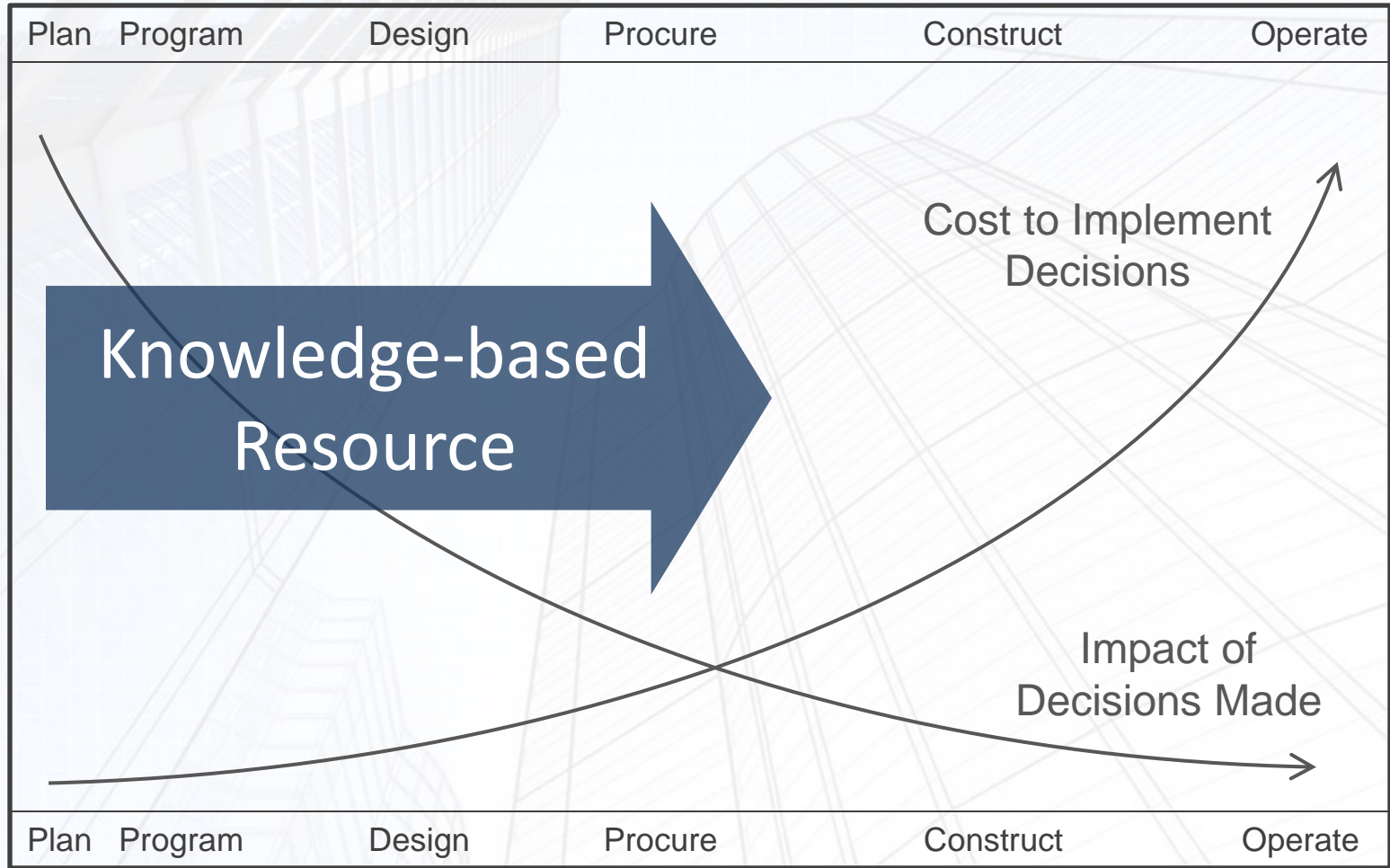
Current BIM State: Adapted MacLeamy Curve





# The Next BIM Generation

## Fulfilling the Original BIM Vision



Original BIM Vision: Adapted MacLeamy Curve





How to Fulfill the Original BIM Vision?

A Scientific Systems Approach  
To Acquiring Knowledge  
To Optimize Value





## The Deming Scientific Systems Approach

A network of interdependent  
attributes working together to  
accomplish the *aim of the system*



## The Deming Scientific Systems Approach

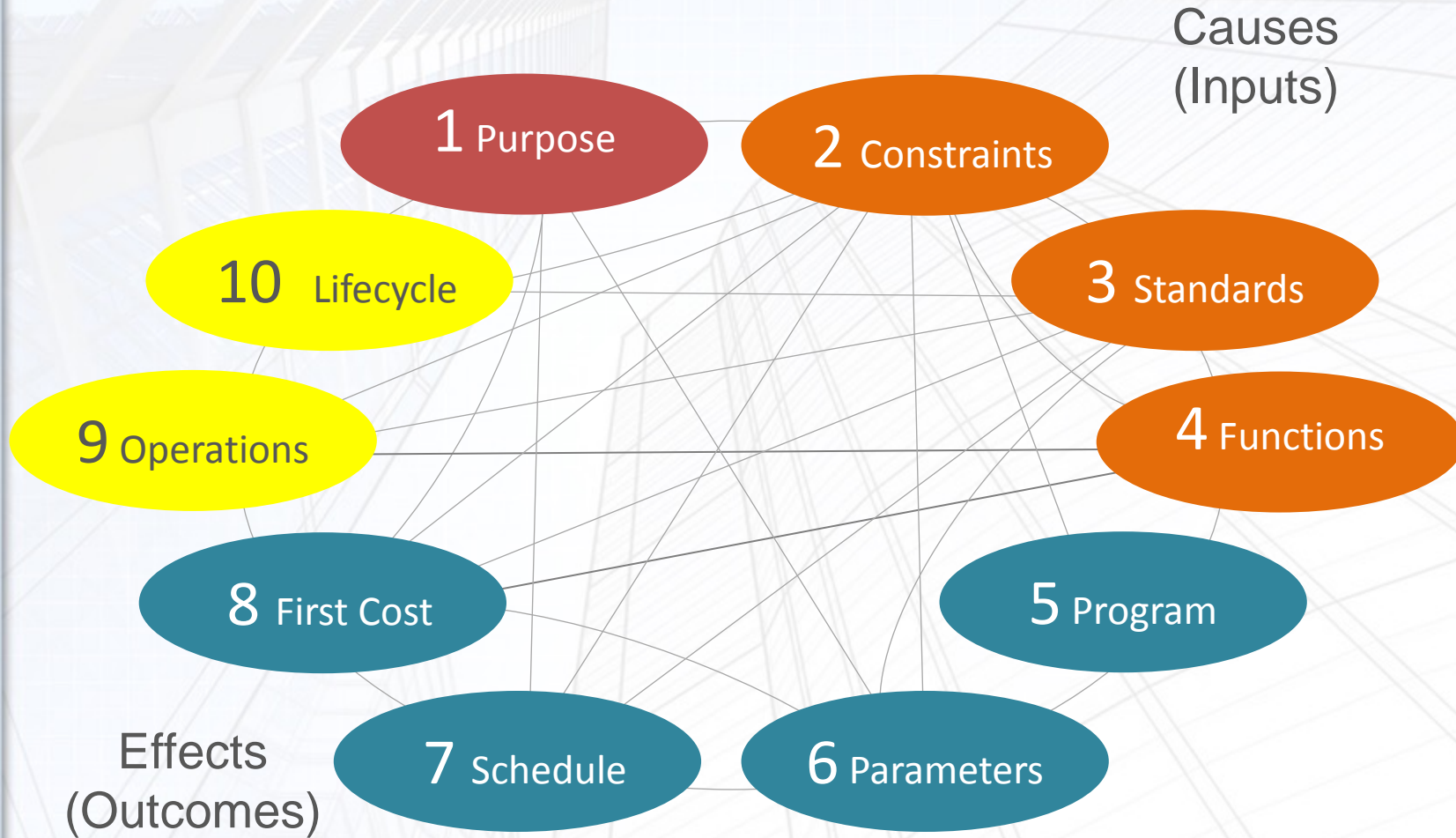
A network of interdependent  
attributes working together to  
accomplish the *aim of the system*



Functional Characteristics

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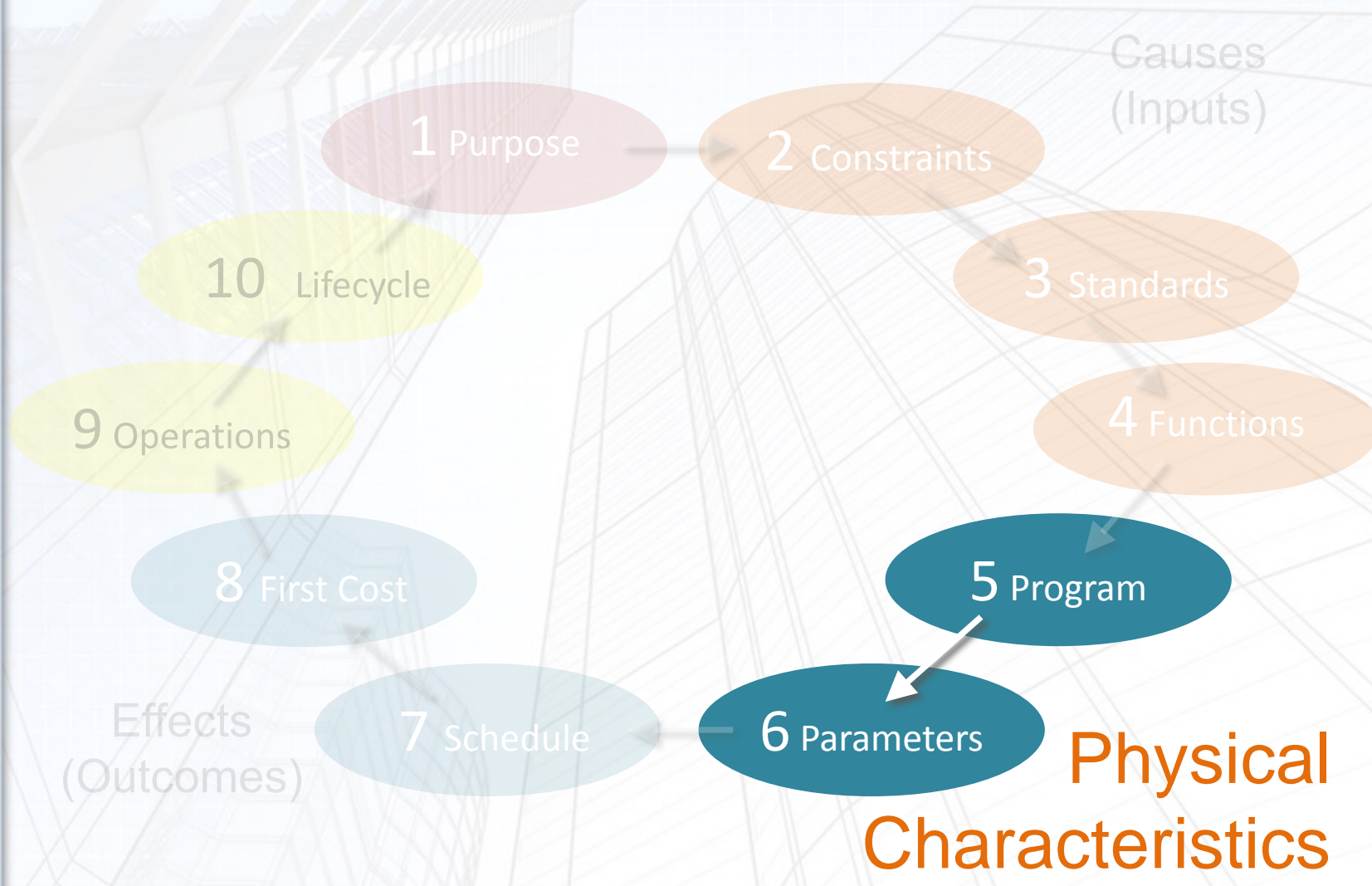
## Complete BIM Eco-System





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Fulfilling the Original BIM Vision

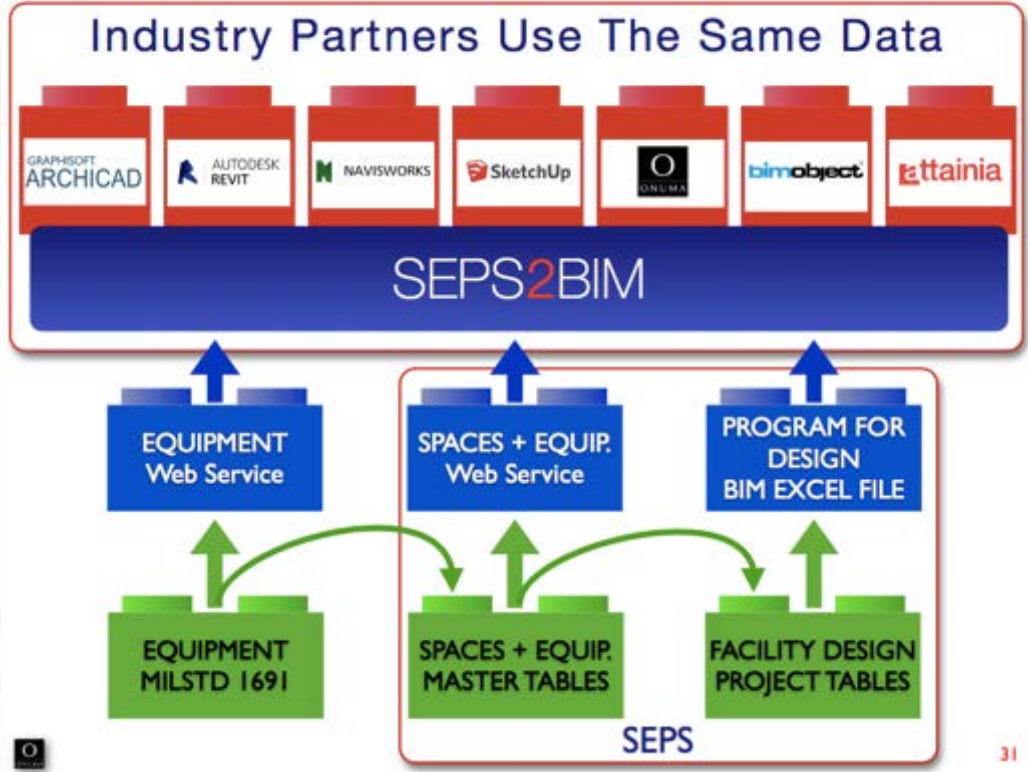


## Current BIM Focus

Fulfilling the Original BIM Vision



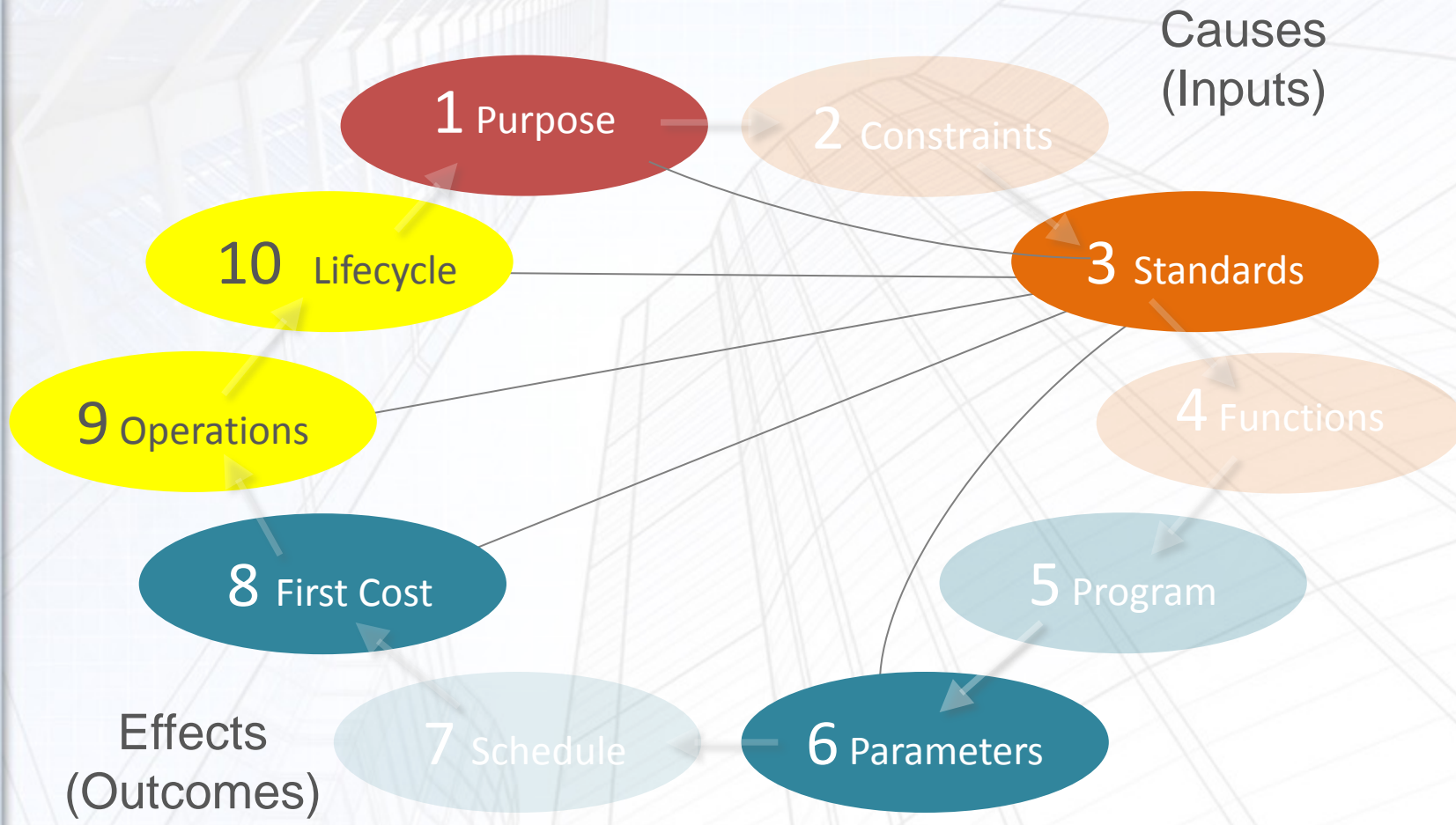
## ONUMA Planning System



# Current BIM Focus Data Independence

# The Next BIM Generation

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## NIBS/DHS - OPR Focus

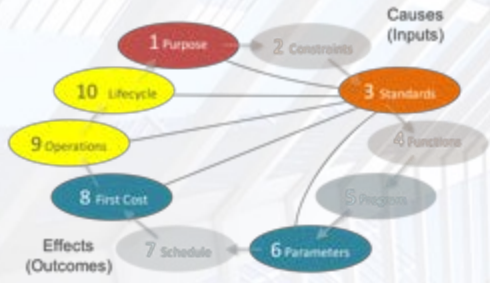




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## Produced by National Institute of Building Sciences





### Owner Project Requirements (OPR) Tool - Beta Version

for Performance Based Design

developed and managed by the National Institute of Building Sciences  
in partnership with Department of Homeland Security/Science and Technology Directorate

[ABOUT](#) | [CONTACT](#)



The Owners Performance Requirements (OPR) Tool helps building owners identify priorities and prepare a performance plan for a project by selecting targets for each of the attributes identified as comprising high performance by the Energy Independence and Security Act of 2007 (EISA). The OPR Tool, focused in this version on the building envelope for office buildings, establishes a performance based plan for the owner to provide to the design team at the beginning of project programming. [Learn more...](#)

#### Please Sign In

Email Address:

Password:

Remember my login at this computer.

#### Resources

- [About the DHS High Performance and Integrated Design Resilience Program](#)
- [About the OPR Tool](#)
- [About the NIBS Integrated Resilient Design Program](#)



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The Owners Performance Requirements (OPR) Tool helps ...prepare a performance plan...for each of the attributes identified as comprising high performance by the *Energy Independence and Security Act of 2007* (EISA).

## Attributes (Demands + Standards):

1. Energy conservation
2. Environment
3. Safety
4. Security
5. Durability
6. Accessibility
7. Cost-benefit
8. Productivity
9. Sustainability
10. Functionality
11. Operational considerations



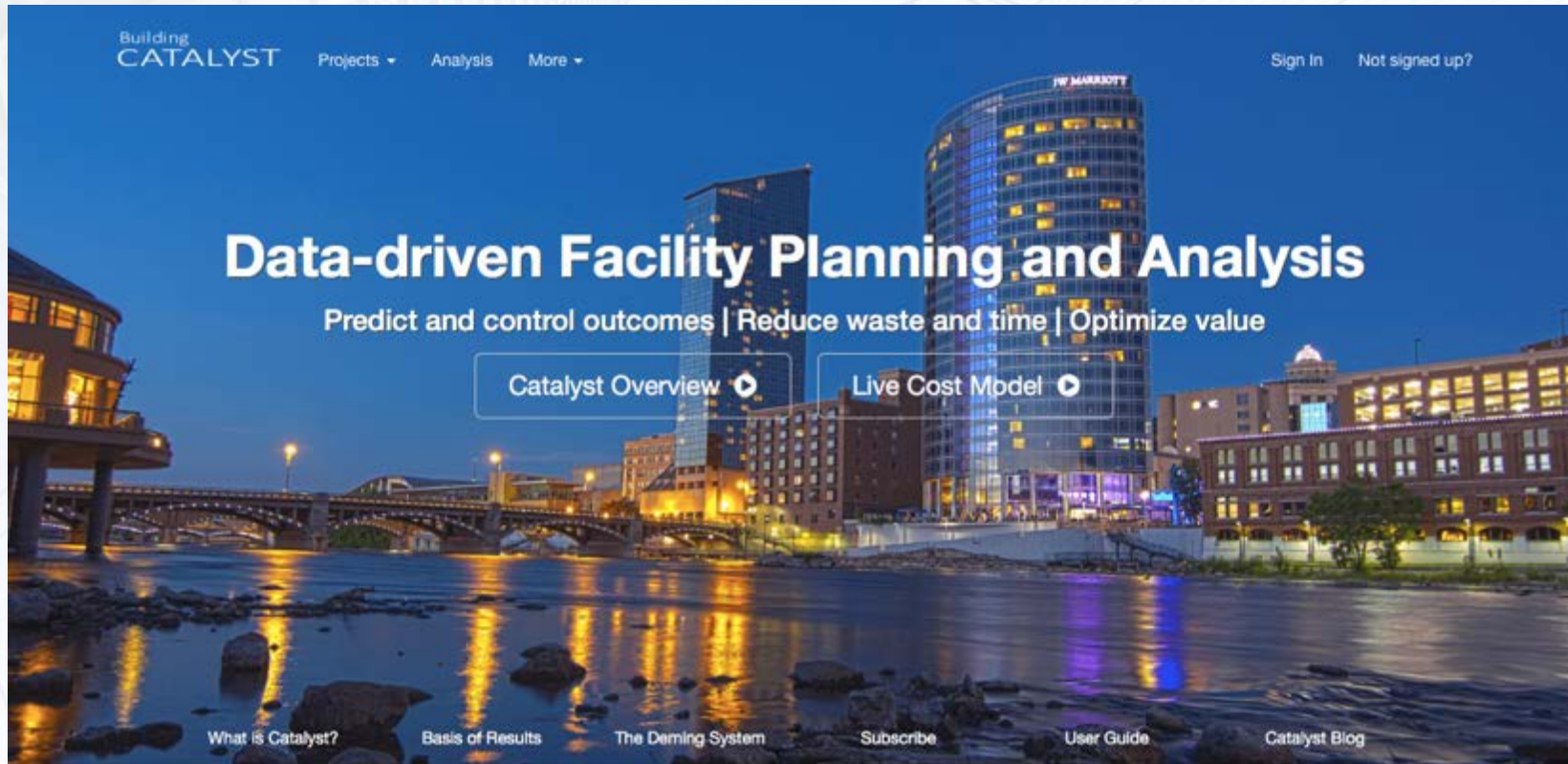




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## Comprehensive Planning BIM Illustration



### A Systems Approach to Construction

Building Catalyst applies a Systems Approach to facility planning, design, and production. Catalyst is construction's first generation of comprehensive predictive modeling and analysis.





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**BUILDING  
INNOVATION** 2017

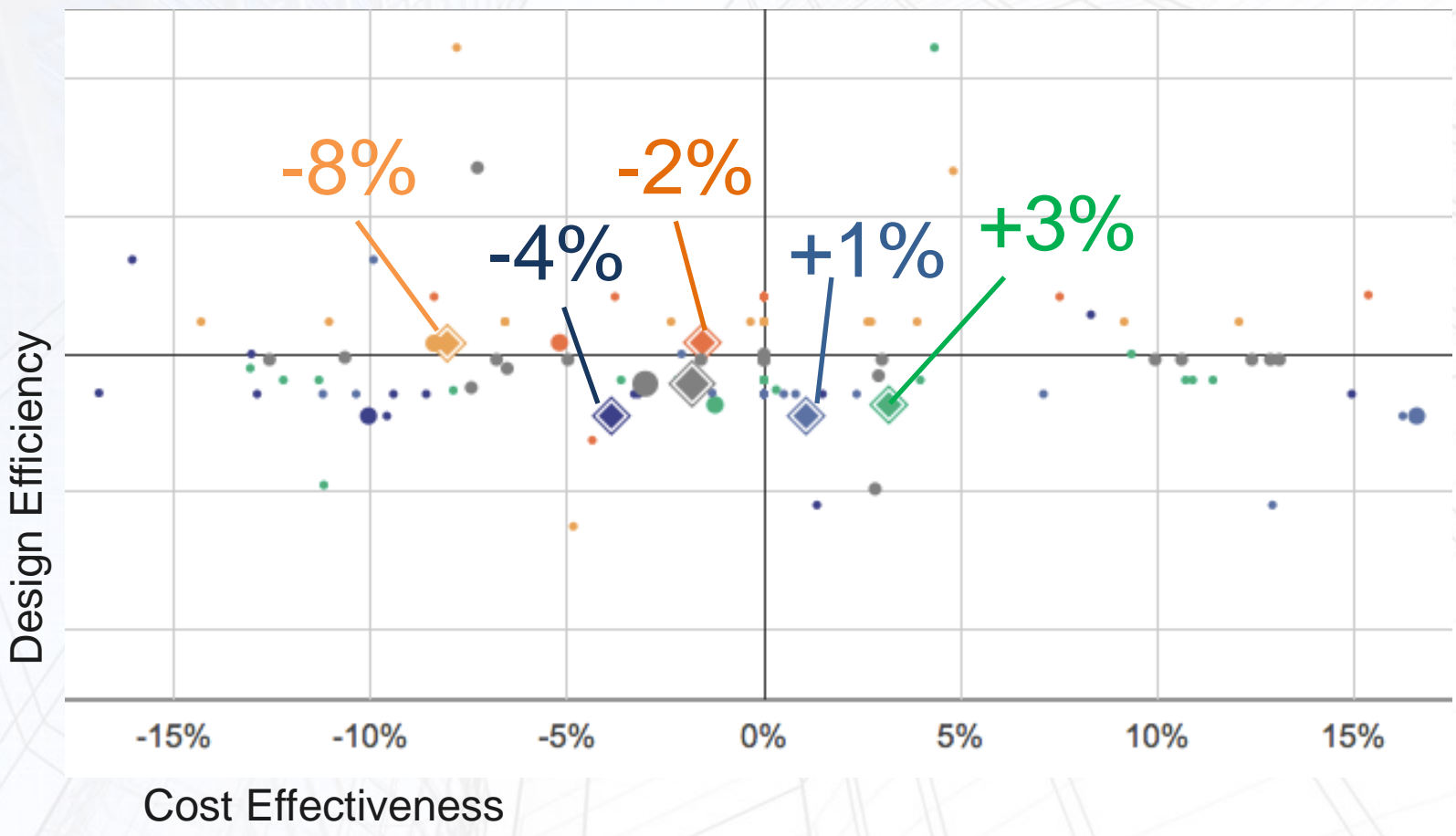
National Institute of  
BUILDING SCIENCES

CONFERENCE & EXPO

Research – Data Analysis for Accuracy



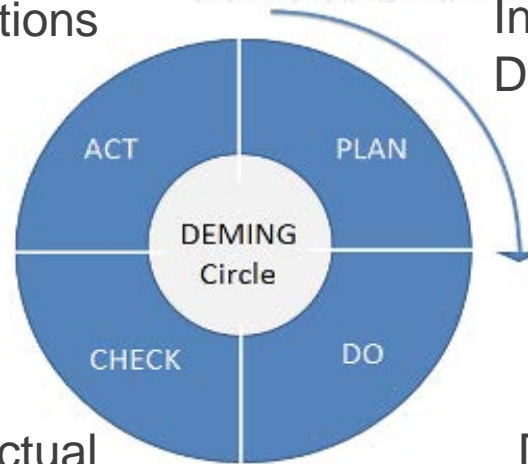
## Senior Living & Care Facilities



### Scientific Method to the BIM Development as a Knowledge Resource

**ACT:** Revise Algorithms and Predictions. Ask new questions, and add new Inputs to address Variation and Interactions

**PLAN:** Form Algorithms and Predictions of Program, Scope and Cost based on Inputs: Functions, Constraints, Demands and Standards



**CHECK:** Compare Actual Results to Predicted; Query and study across Inputs for insights regarding Variation and Interactions

**DO (Done):** Compile Actual Results of Program, Scope and Costs from sampling from real world project inventory





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Because science may offer the answer  
to the curse of the Bambino





## BIM Purposes Now Attainable

- *Reliably Predict Outcomes*
- *Manage to More Certain Outcomes*
- *Reduce Conflict, Waste and Defects*
- *Drive Higher Performance, Improve Value*



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## Join the Next BIM Generation

Building R & D Cooperative  
*aka*  
The Moneyball Club







**BUILDING  
INNOVATION** 2017

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# This concludes The American Institute of Architects Continuing Education Systems Course

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Building  
**CATALYST**

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