



The Next BIM Generation

Fulfilling the Original BIM Vision

National Institute of Building Sciences

Provider Number: G168

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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



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

Not Really!





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

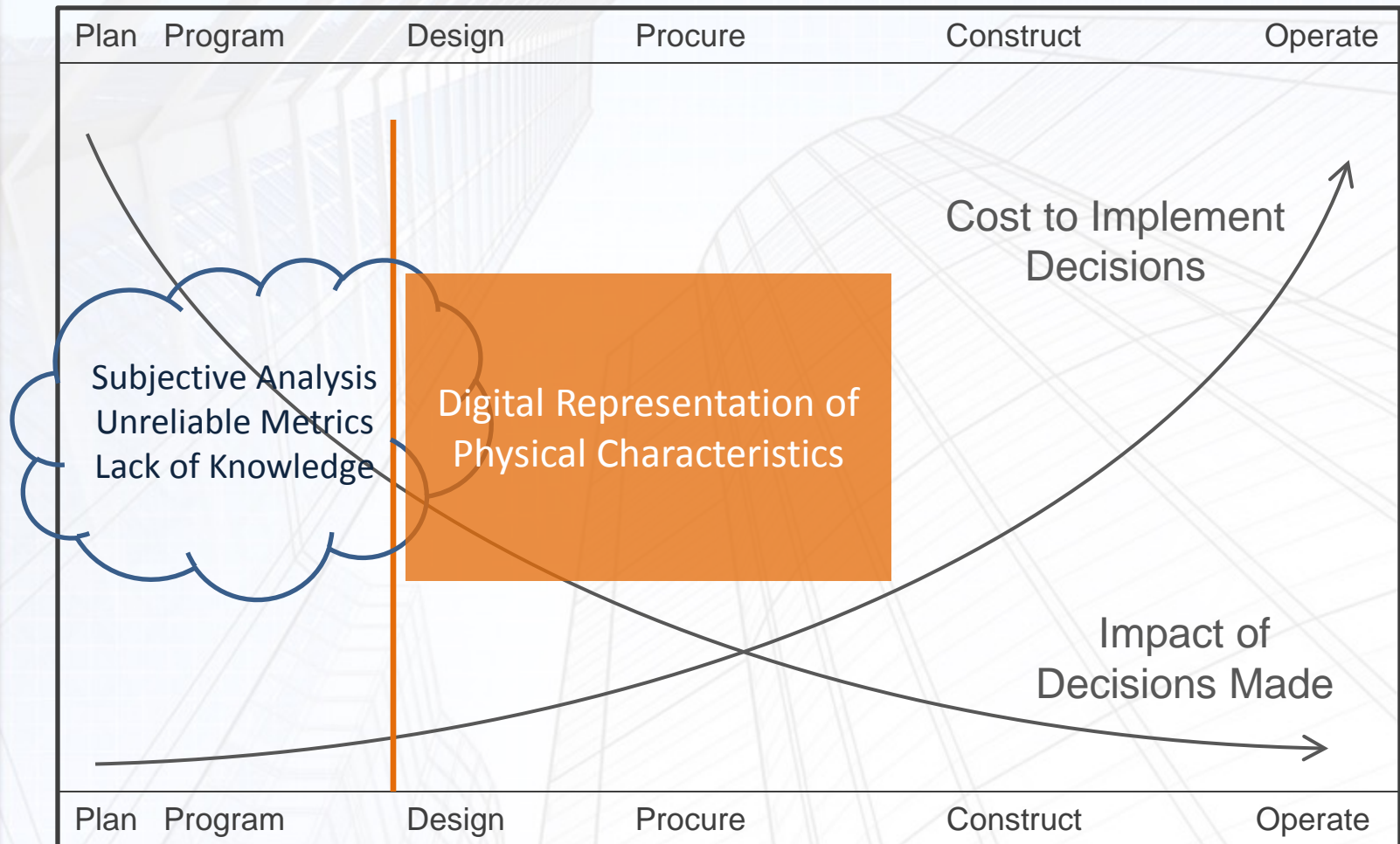
- *Digital Representation*
 - *Physical Characteristics*
 - *Functional Characteristics*
- *Knowledge Resource*
 - *Life Cycle Decision Making*
 - *Decision Making from Project Inception*

>90% of Today's
BIM Practice



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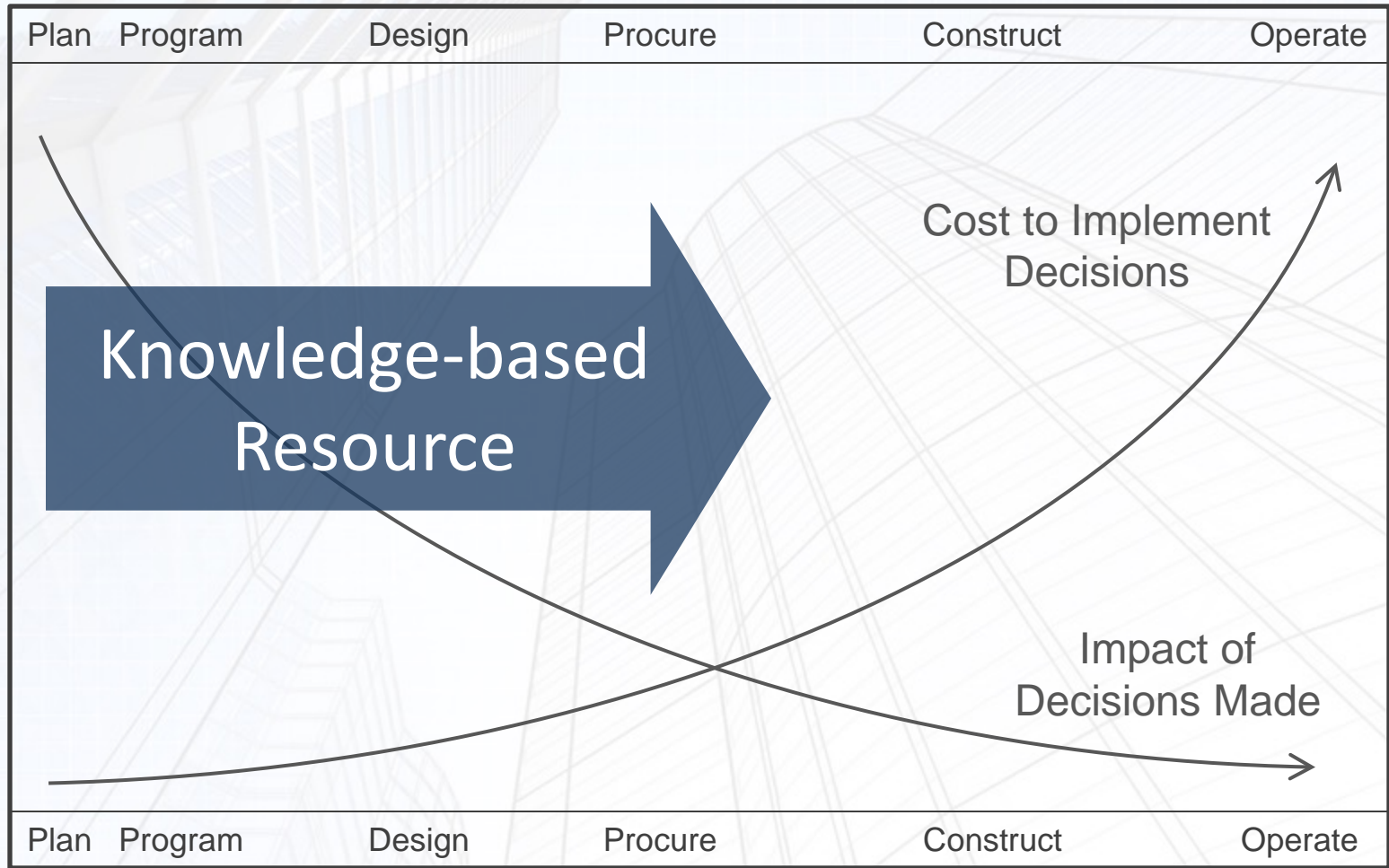


Current BIM State: Adapted MacLeamy Curve



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↑ Inception **→** Life Cycle

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

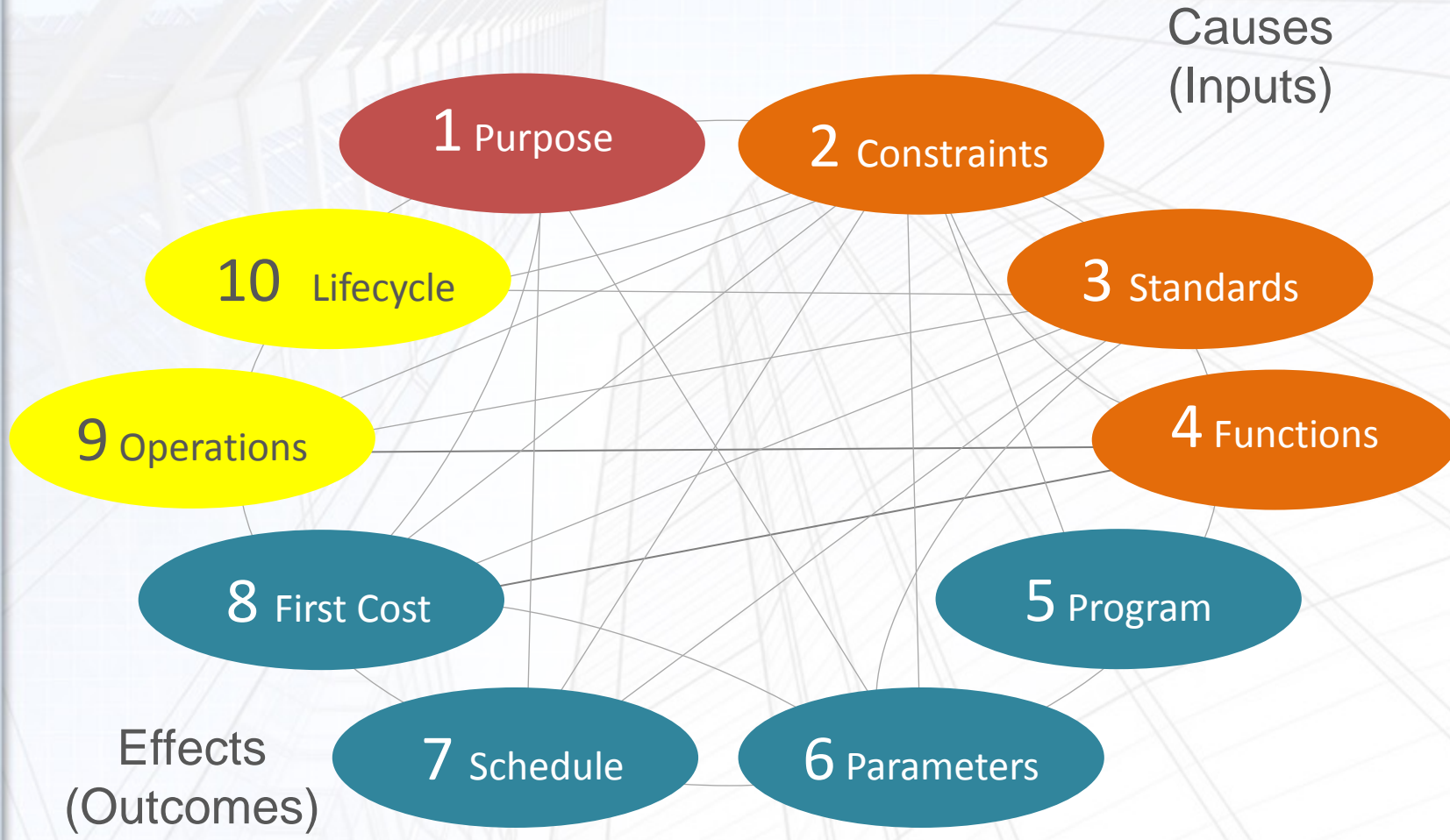
A network of interdependent
attributes working together to
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Functional Characteristics

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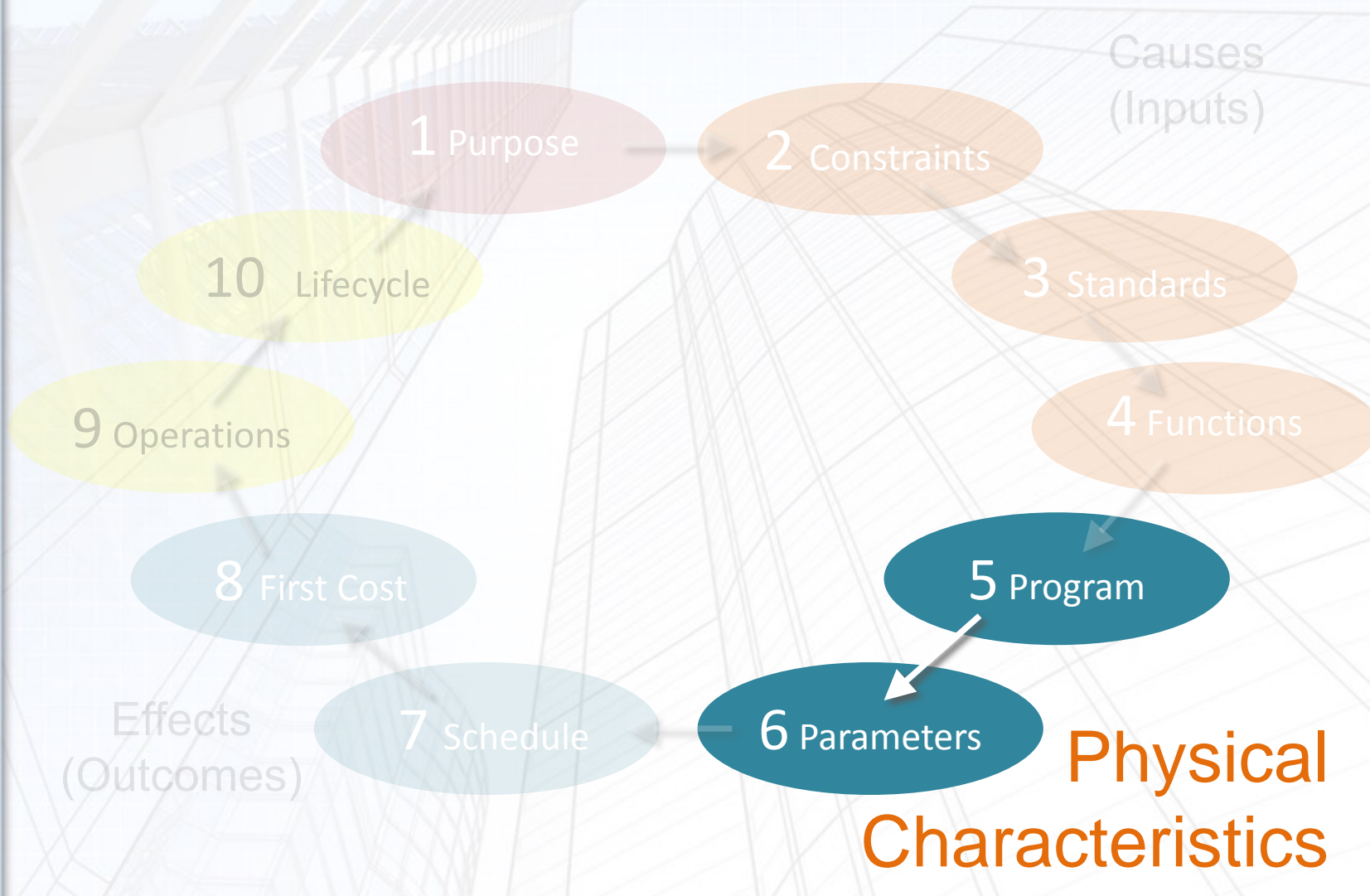
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Complete BIM Eco-System

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Current BIM Focus

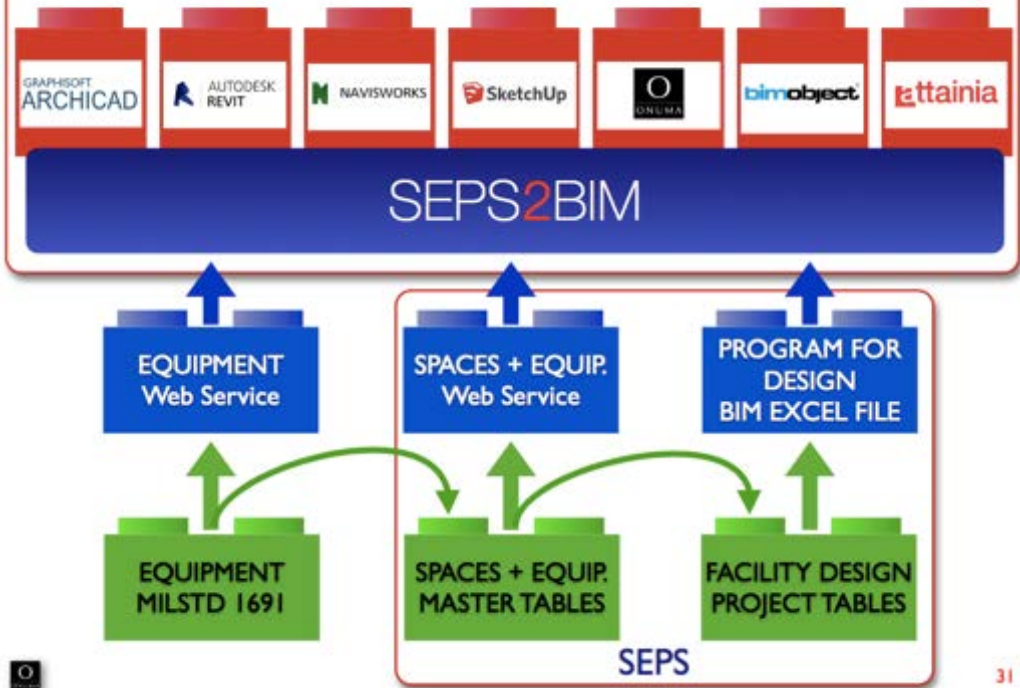
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ONUMA Planning System

Industry Partners Use The Same Data

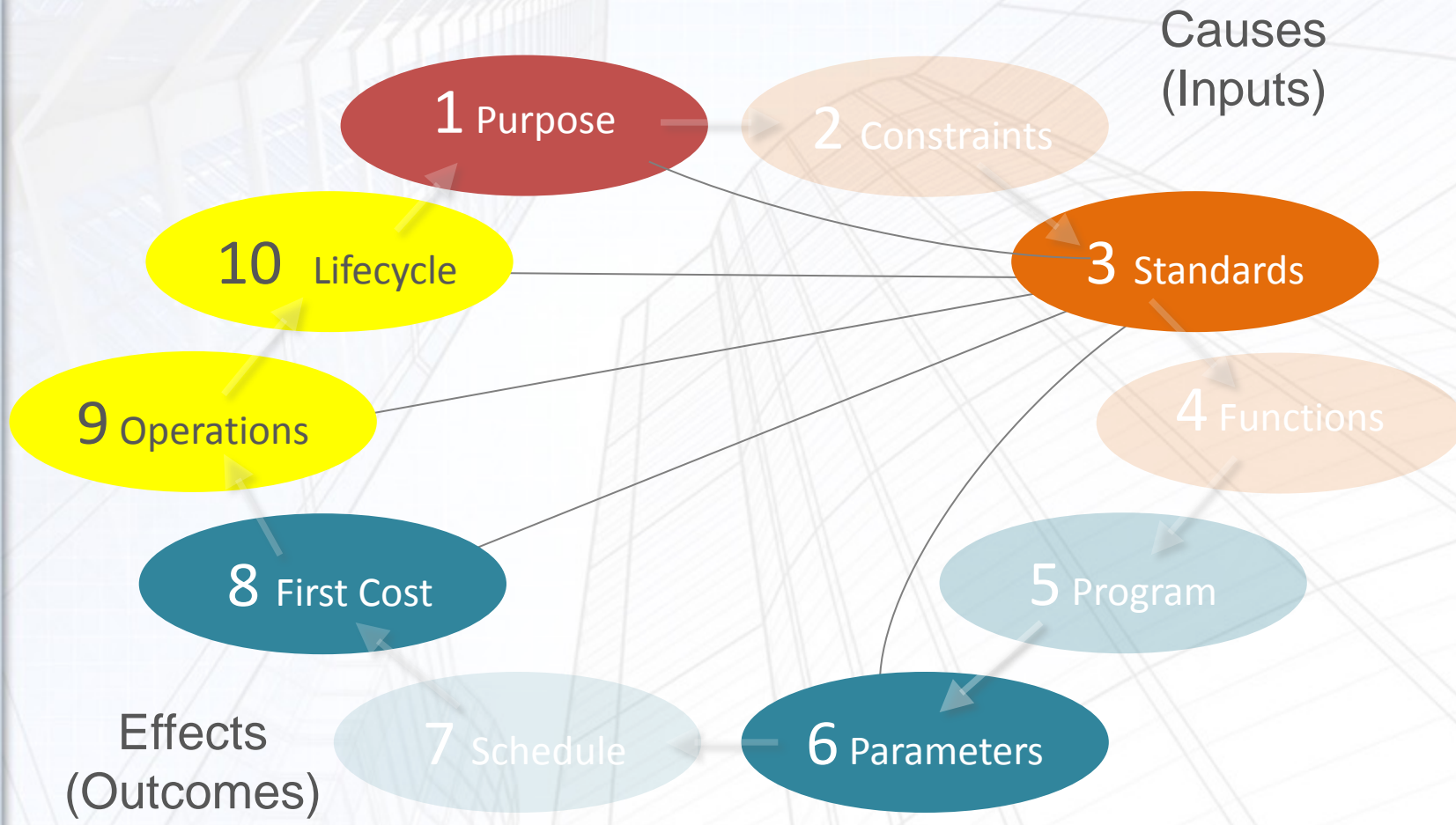


Current BIM Focus Data Independence



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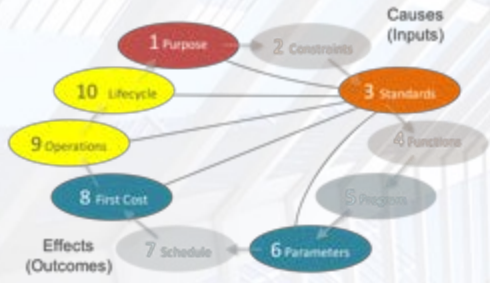
NIBS/DHS - OPR Focus



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Produced by National Institute of Building Sciences





Homeland Security

Science and Technology

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

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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

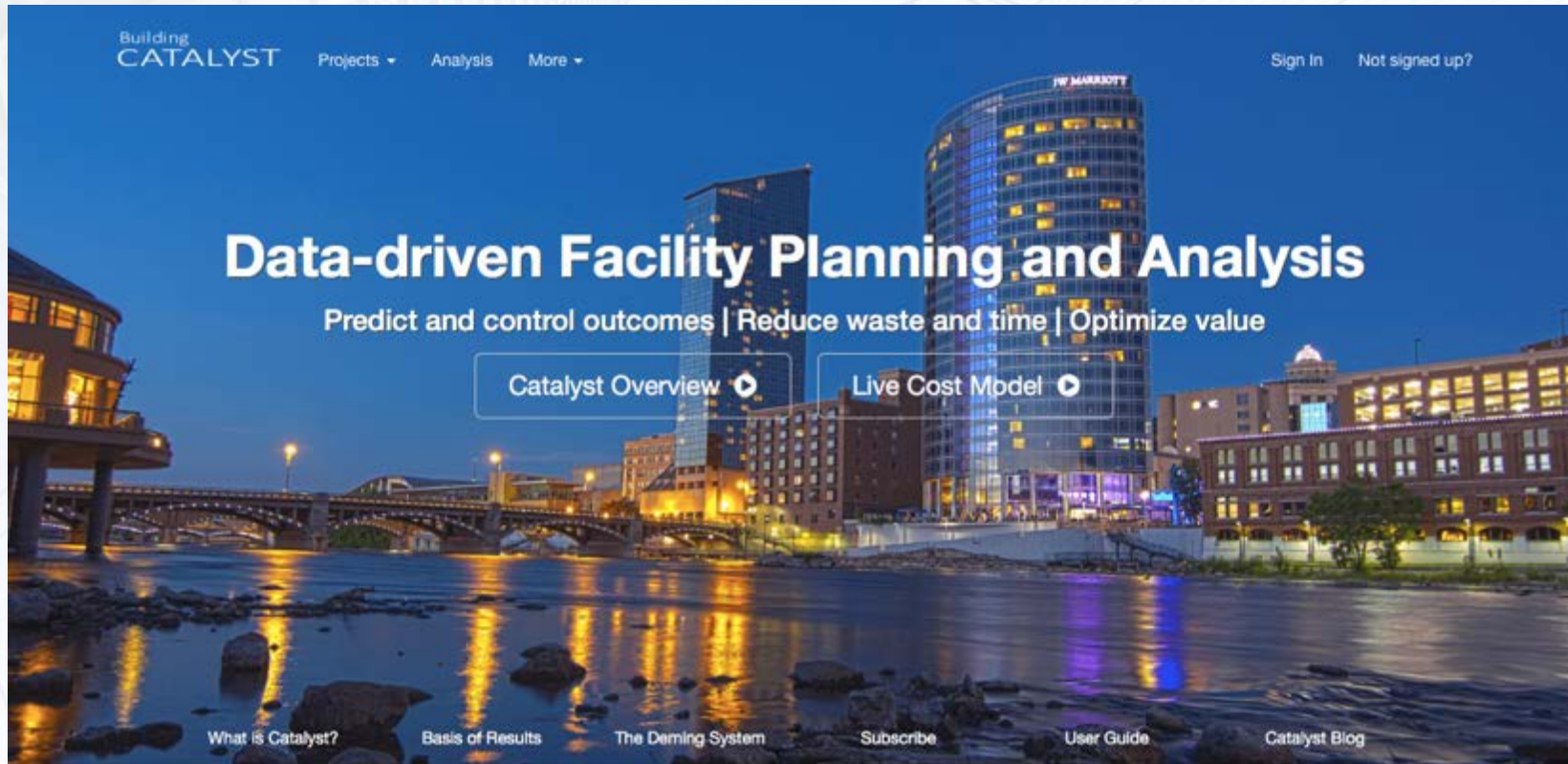




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Comprehensive Planning BIM Illustration



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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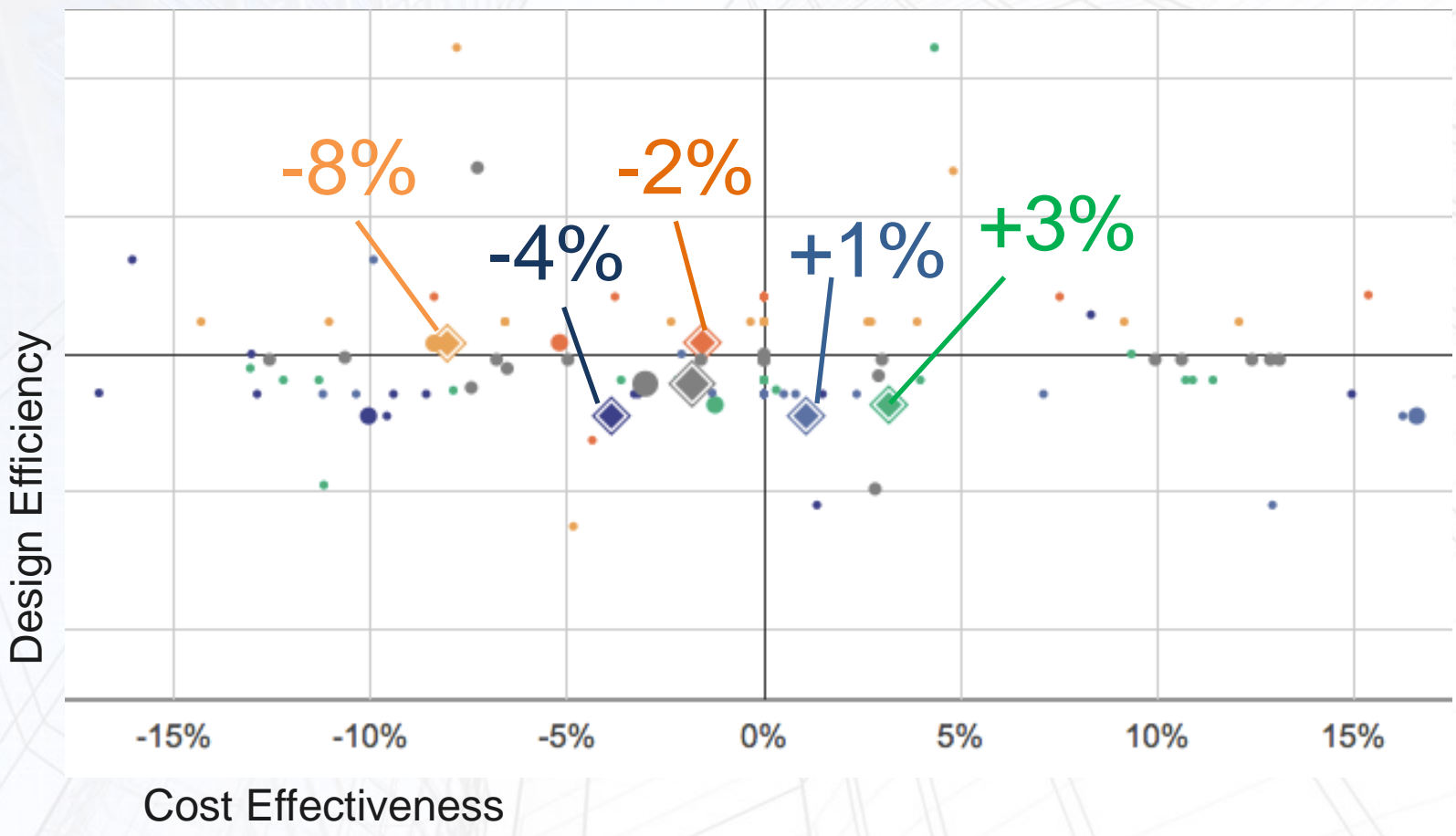
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Research – Data Analysis for Accuracy



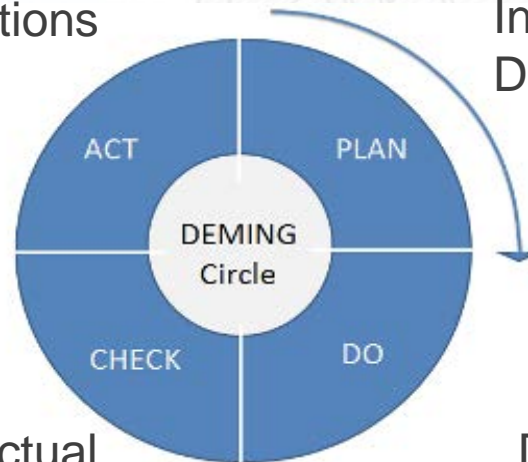
Senior Living & Care Facilities



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*
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- *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

National Institute of
BUILDING SCIENCES

CONFERENCE & EXPO

This concludes The American Institute of Architects
Continuing Education Systems Course

Building
CATALYST

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