Data-Driven Success

How Being a Data-Centric Organization Maximizes the Value of Digital Technologies

08.19.2025

DODGE CONSTRUCTION NETWORK

THE CATALYST FOR MODERN CONSTRUCTION

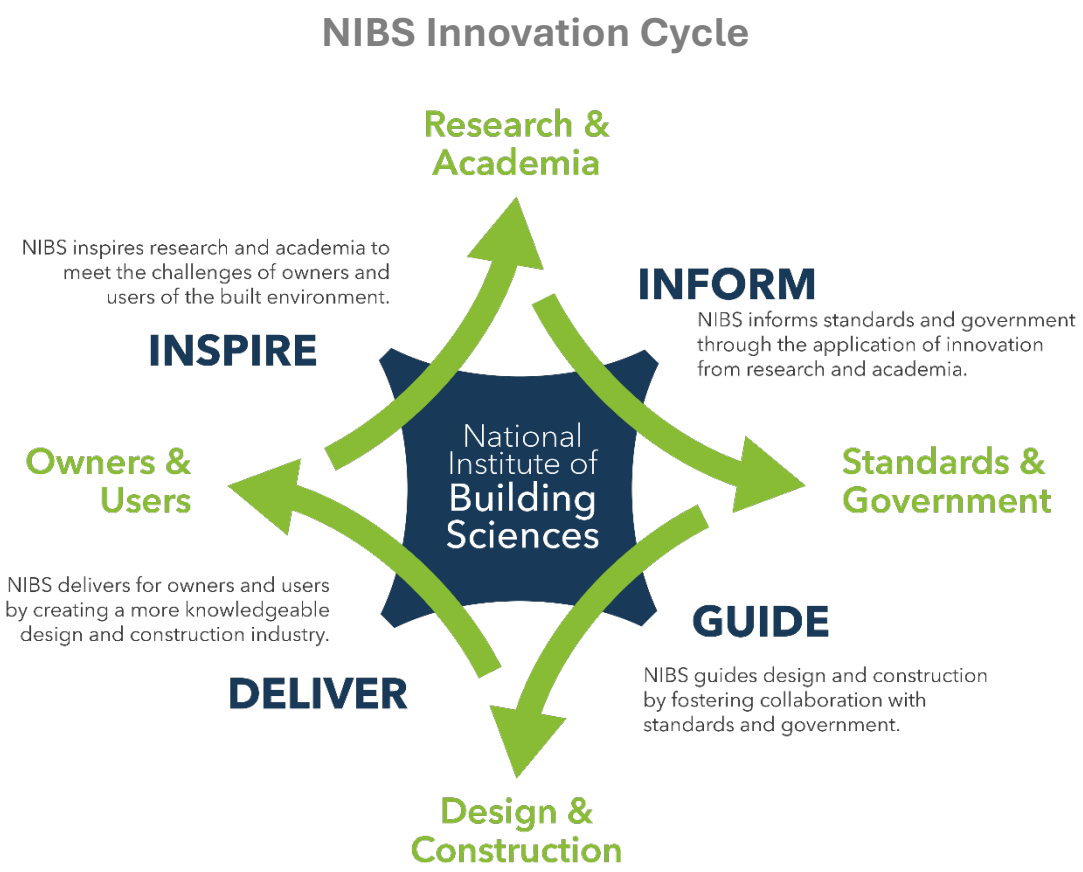
Speakers

Donna Laquidara-Carr
PhD, LEED AP
Industry Insights Research Director
Dodge Construction Network

Roger J. Grant
Vice President
Building Technologies
National Institute of Building Sciences

Who We Are: The National Institute of Building Sciences (NIBS)

Congress-Chartered, Nonprofit, Public-Private Collaborator for Accelerating Innovation



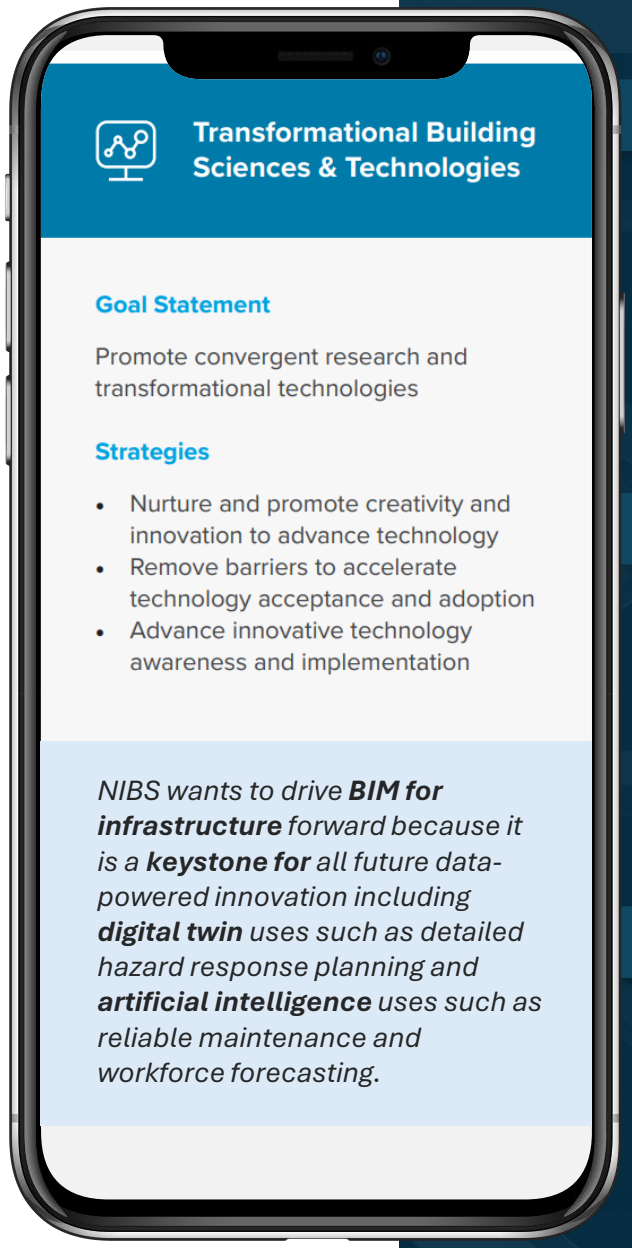
- Established by Congress in 1974 to bridge the gap between government and industry in **improving the built environment on behalf of the public.**
- National **convener and technical integrator** across planning, design, construction, and operations.
- Applies expertise in innovation planning, modeling, data integration, and systems thinking **to support intelligent delivery and management of assets**: facilities, transportation networks, utilities, digital assets, and institutional knowledge.
- Lead digital modernization initiatives such as:
  - **Digital Technology Council (DTI-C, NBIMS, NCS)**
  - **Data-centric Owner SmartMarket Report**
  - **ISO/TC 59/SC 13 assumption of chair**
  - **FHWA Digital Delivery Stakeholder Group, Central BIM Transportation Library, BIM for Bridges EC**
  - **NAVFAC AI to Streamline Design and Construction**
  - **OBO Modernization Change Management Plan**
  - **OBO BIM & Digital Twin Program**
  - **GSA – BIM IFC Process Mapping**
  - **VA SEPS to BIM Library**

Driving Innovation for the Public Interest

NIBS believes building innovation is the foundation of American innovation.

Congress tasked NIBS to advance for the American public a data-driven, science-based, technologically augmented future that safeguards, enables, and empowers lives, livelihoods, and communities across the Nation.

NIBS engages in work that spans all three phases of innovation in order to move the nation towards this vision.

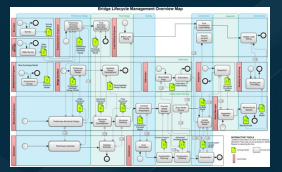


National Institute of BUILDING SCIENCES
Building American Innovation

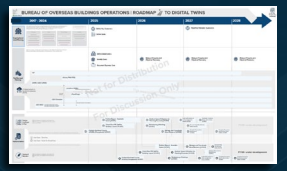
Stages of Development

Strategic Analysis, Planning, & Alignment

Research, Assessments, Use Case Documentation, Implementation and Alignment Roadmaps

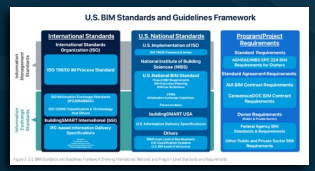


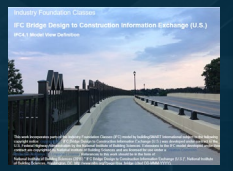
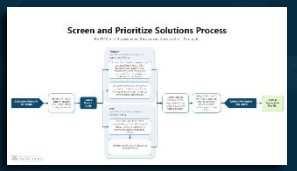




Preparation, Standardization, & Optimization

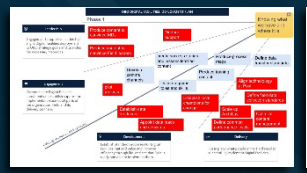
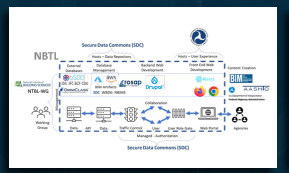
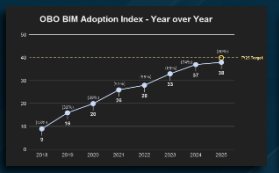
Functional Enablement, Tooling and Configuration, Owner Standards, Open Standards, Processes, Policy

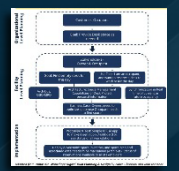


Implementation and Continuous Improvement

Capacity Building, Education, Change Management, Knowledge Management, Continuous Improvement



Building on our Mission

- Findings provide evidence of a data-driven transformation in the construction industry
- Empowers building professionals, policymakers and owners to make informed, prioritized investment and risk decisions that enhance sustainability, efficiency and resilience
- Study demonstrates value of effective data use and technology adoption for Owners

PREMIER PARTNER

CONTRIBUTING PARTNERS

RESEARCH PARTNERS

Leveraging 21st century tools and a comprehensive national network to improve lives and communities through buildings and infrastructure.

Methodology

REPORT AVAILABLE FOR FREE DOWNLOAD:
www.construction.com/resources

188 owners participated in an online survey from November 2024 to February 2025.

- Responses recruited by Dodge, NIBS, Autodesk, Esri, Trimble, ARTBA, COAA, CURT, DBIA, Infotech and LCI
- Types of organizations who responded:
  - Local Government: 33%
  - Private/Commercial Company: 29%
  - Public/Private Institution: 19%
  - State/Federal Agency: 18%
- Respondents' Areas of Influence:
  - Design/Construction: 71%
  - Procurement: 62%
  - Technology: 57%
  - Planning/Programming: 55%
  - Finance: 39%
  - Asset Management: 34%

Methodology

REPORT AVAILABLE FOR FREE DOWNLOAD:
www.construction.com/resources

188 owners participated in an online survey from November 2024 to February 2025.

- Responses recruited by Dodge, NIBS, Autodesk, Esri, Trimble, ARTBA, COAA, CURT, DBIA, Infotech and LCI
- Types of organizations who responded:
  - Local Government: 33%
  - Private/Commercial Company: 29%
  - Public/Private Institution: 19%
  - State/Federal Agency: 18%
- Top Types of Assets Built/Maintained by Their Org:
  - Institutional Buildings: 65%
  - Commercial Buildings: 42%
  - Water Utilities: 38%
  - Power/Energy Projects: 33%
  - Industrial Buildings: 26%
  - Manufacturing Buildings: 14%

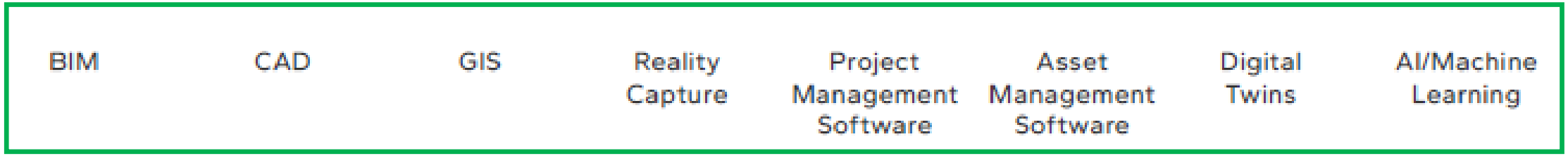
Report Contents

REPORT AVAILABLE FOR FREE DOWNLOAD:
www.construction.com/resources

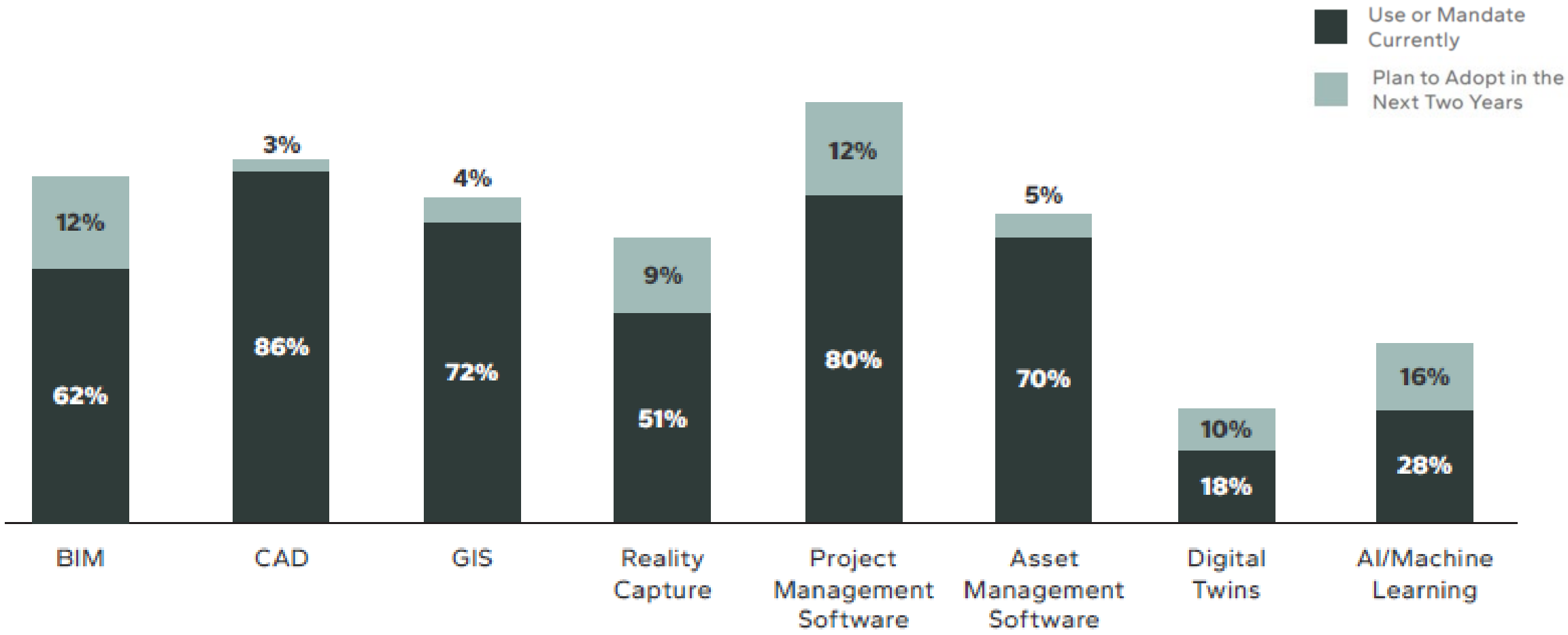
Table of Contents

Owner Use of Digital Technology

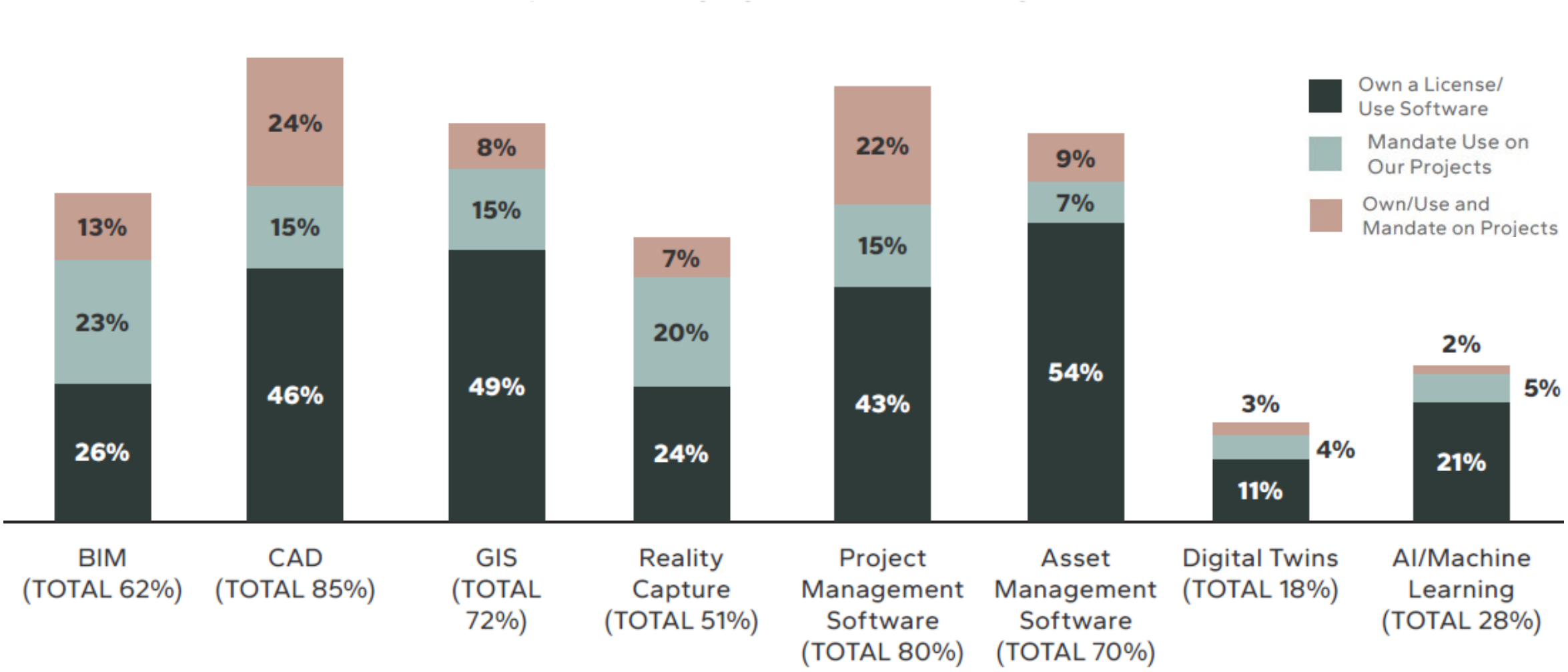
Study Measured Engagement With 8 Technologies



Highly Engaged Now With More Expected



Most Own the Tech Used on Their Projects



Less Than Half Use Tech for Specific Activities

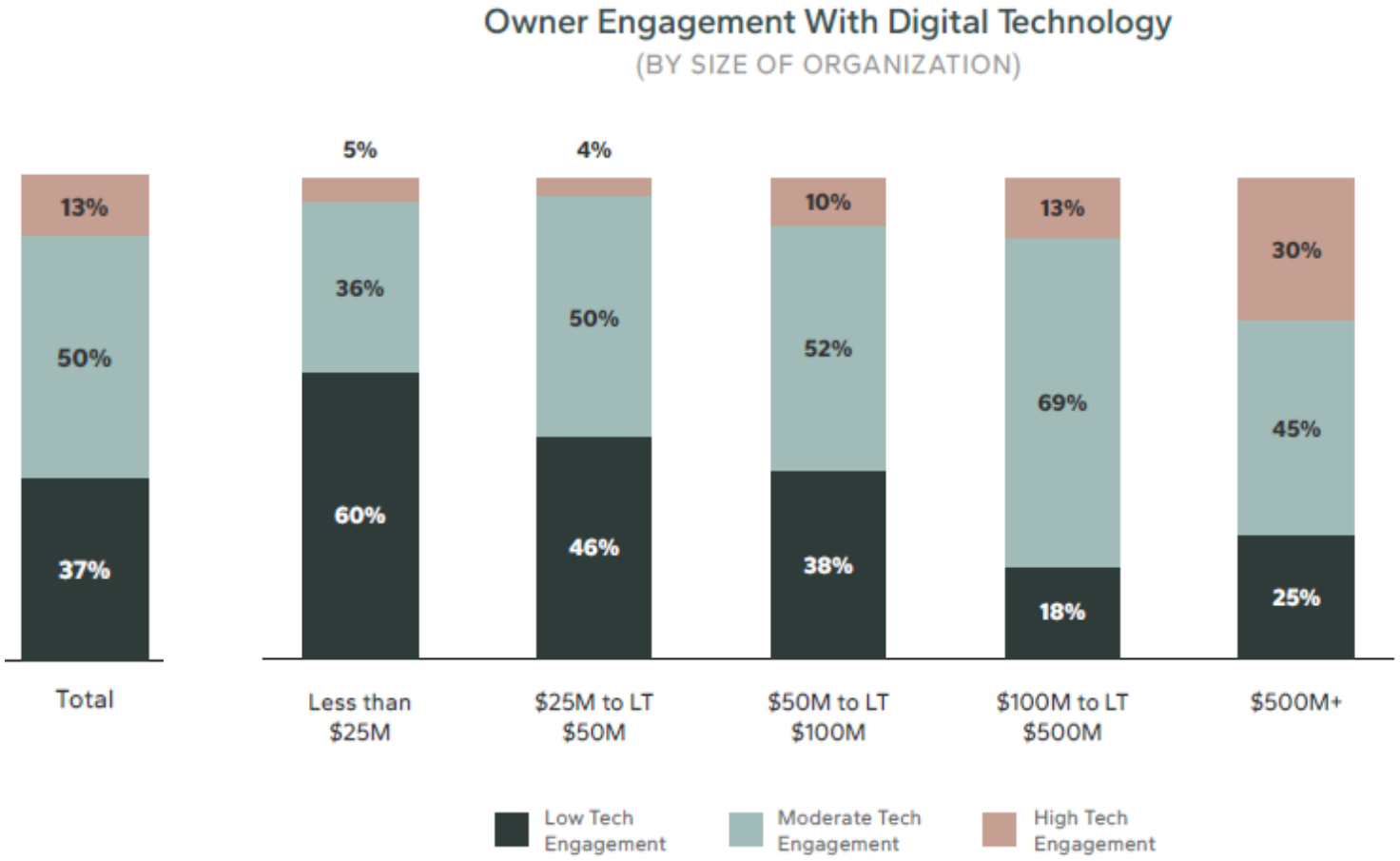
Planning and Design	Design/ Model Analysis	Construction	Asset Mgmt/ Operations
Produce construction documents: 49%	Create quantities and cost estimates: 44%	Coordinate design and construction: 49%	Asset management: 41%
Capture existing conditions for modeling etc.: 39%	Validate design intent and details against project requirements: 31%	Layout construction: 46%	Monitoring/ managing physical space of assets: 24%
Establish project requirements: 38%	Analyze design to assess functionality and compliance with requirements: 28%	Compile record deliverables at project completion: 38%	
Author design: 18%	Extract model data to develop project and/or lifecycle cost estimates: 22%	Sequence construction: 32%	
Generate fabrication details: 15%		Author temporary work: 9%	

40% or More 30% to 39% 20% to 29% Less Than 20%

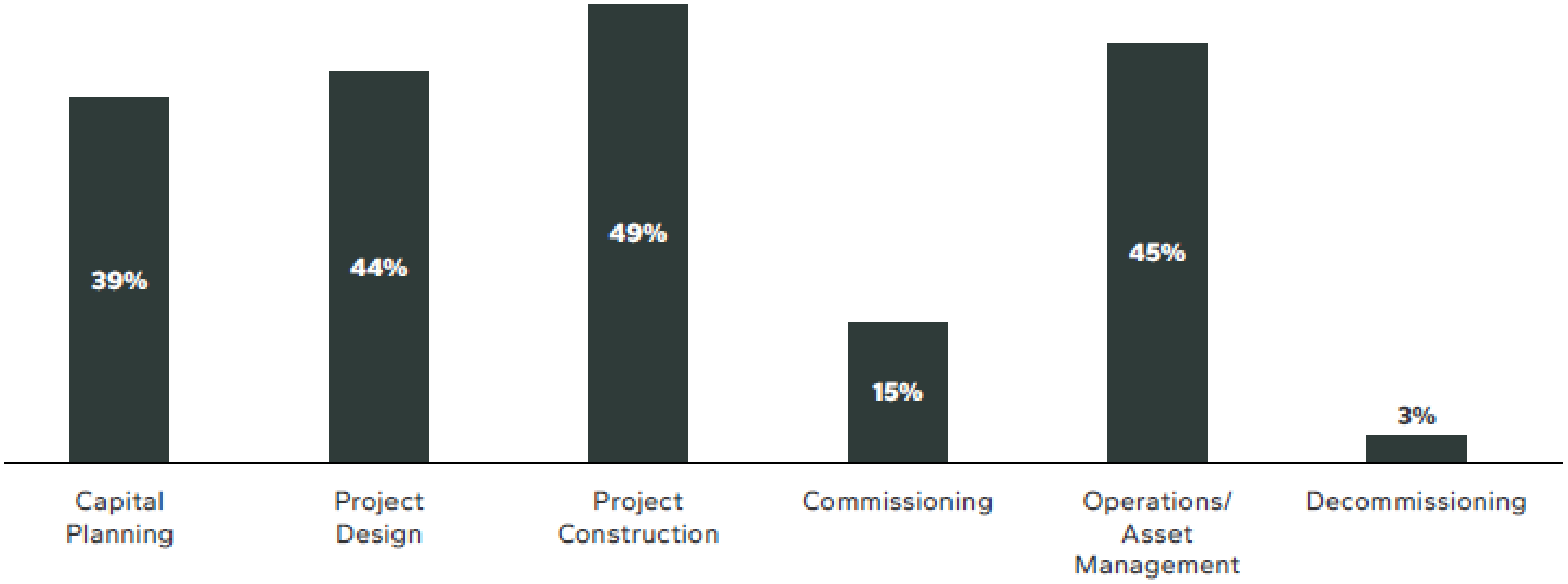
Owner Engagement With Technology

Technology Engagement Index
Calculated by assigning points for the use of technologies and for the specific functions conducted with digital technologies.

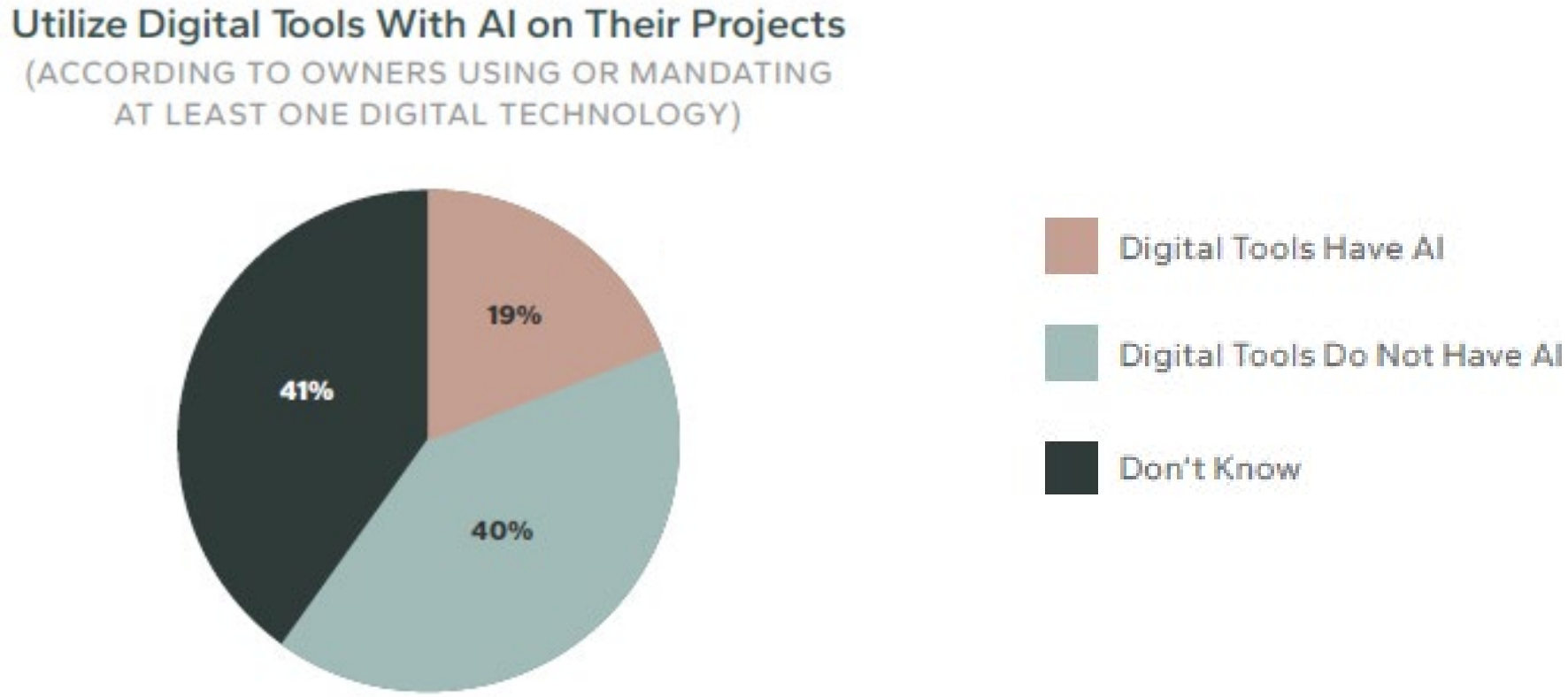
- **Limited Engagement:** Less than 25% of total points possible
- **Moderate Engagement**: 25% to 49% of total points possible
- **High Engagement**: 50% or more of total points possible



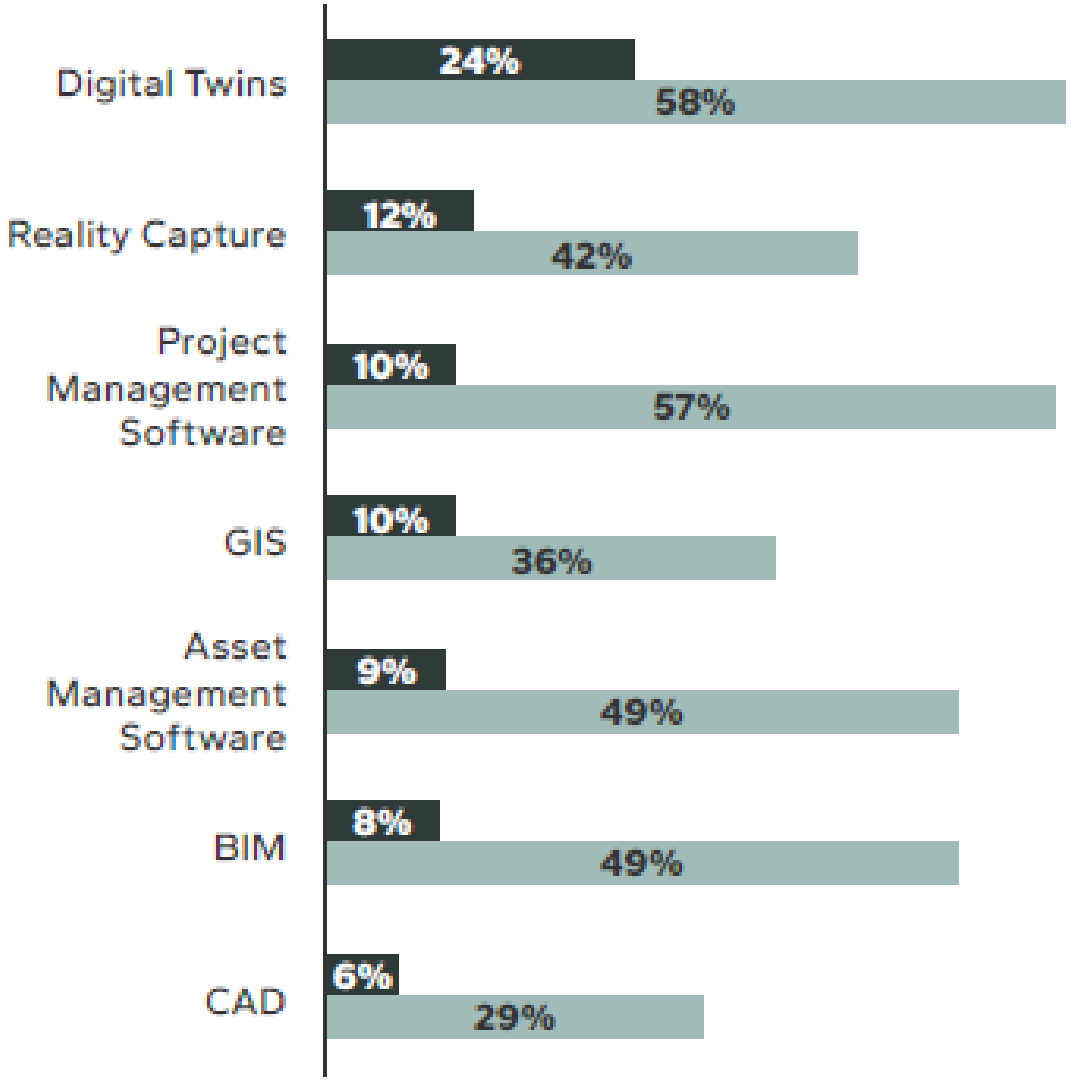
Expect to Invest in Tech in the Next Two Years



AI Is Still Not Widely Understood



Owners Want to Engage More With AI



Users of Each Type of Tech Who

- Believe Current Tools Use AI
- Interested in Seeking Tools Augmented With AI in the Next Three Years

Data-Centric Owners

Use of Data-Centric Approaches

What is a Data-Centric Owner?

The study drew on existing frameworks for a data-centric organization to examine owner engagement with data. Out of 42 total approaches measured, 27 (in these categories) are measured in a similar fashion to allow for a summary analysis.

Organizational Policies and Investments
- Technology infrastructure
- Continual improvement
- Core principles
- Resources
- Process for new technology adoption

Creating/Using Data for Project Management
- Data-related goals
- Documented approach to information security
- Data-related approaches to achieve goals
- Education and training modules for digital project delivery
- Defined change management strategy
- Automated quality control
- Selecting an information champion

People-Related Approaches That Support Better Data Management
- Regular training on tech and data use
- Role with responsibility for data use in each business unit

Data-Related Approaches That Support Collaboration
- Internal processes and requirements for use of project delivery and asset data
- Define data-centric project procurement, processes, qualifications and contractual requirements

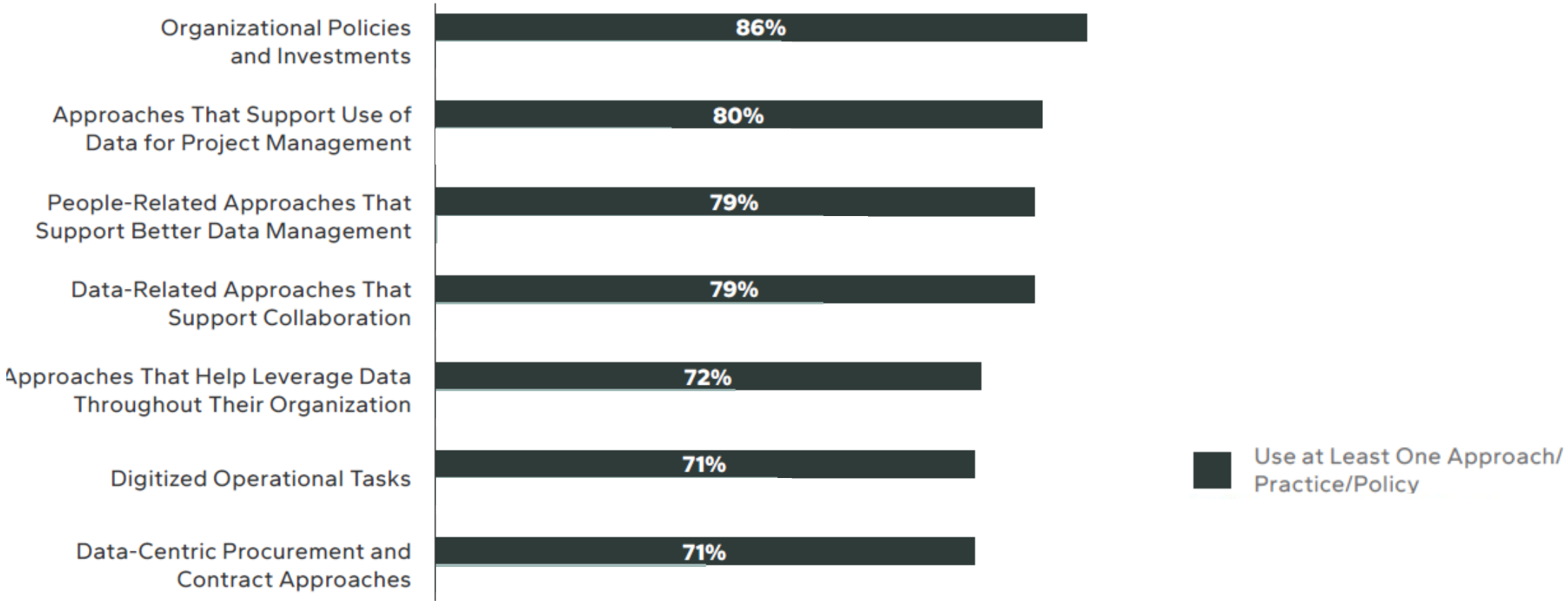
Digitized Operational Tasks
- Manage assets
- Monitor performance
- Manage space

Approaches to Leverage Data Across Org
Integrate data sources for efficient data transfer across projects
- Integrate data and information across functional/business units
- Use industry data standards
- Data quality control process
- Common library of data-rich model components

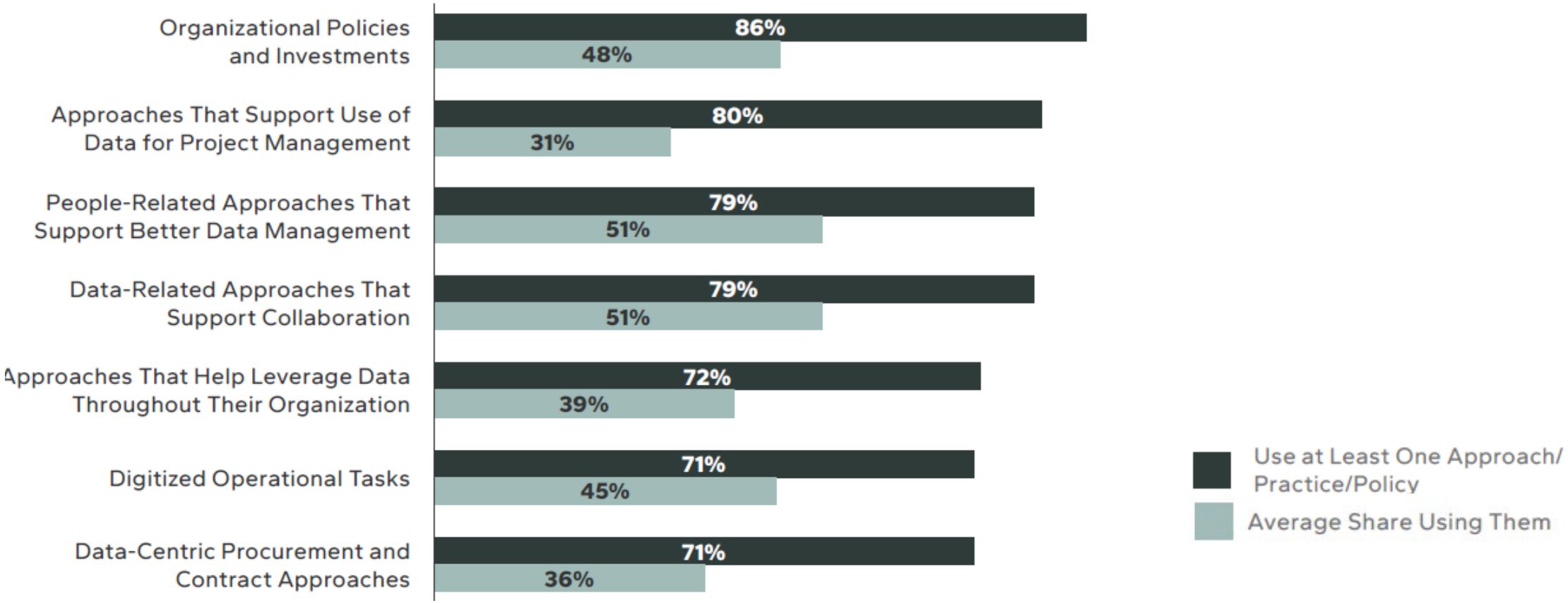
Data-Centric Procurement and Contracts
- Contractual documents supporting data-centric project delivery
- Well-defined digital delivery requirements
- Procurement strategies supporting data-centric project delivery
- Data-centric selection criteria for project teams

Other approaches included in the study: the use of metrics and tracking for many of the approaches above; digitization level of asset handover information; level of deployment of digital asset management approaches; frequency of requiring project teams to use guidelines/plans for data creation/sharing/reus;; requiring data standards during handover; automated performance management tracking

Engagement With Data by Category Using at Least One Approach



Engagement With Data by Category Average Use of Approaches



Use of Specific Data-Centric Approaches

Top Data-Centric Approaches

- Internal processes and requirements for the production and use of project delivery and asset data (70%)
- Investing in technology infrastructure (64%)
- Digitize asset management tasks (61%)
- Require project teams to use data standards (57%)
- Regular education/training on technology and data use (55%)
- Implemented a quality assurance process and metrics to document conformance to standards and policies on at least 50% of their projects (53%)

Least Used Data-Centric Approaches

- Definition of data-centric project procurement processes, qualifications and contractual requirements (32%)
- Processes for new technology adoption (30%)
- Maintain a common library of data-rich components for models (30%)
- Well-defined data-centric selection criteria for project teams (27%)
- Have a defined change management strategy (23%)
- Automated quality control of project data (20%)
- Selecting an information champion on projects (20%)

Use of Specific Data-Centric Approaches

Opportunity: Make infrastructure investments more effective by investing in processes and strategies that help them succeed.

Top Data-Centric Approaches

- Internal processes and requirements for the production and use of project delivery and asset data (70%)
- Investing in technology infrastructure (64%)
- Digitize asset management tasks (61%)
- Require project teams to use data standards (57%)
- Regular education/training on technology and data use (55%)
- Implemented a quality assurance process and metrics to document conformance to standards and policies on at least 50% of their projects (53%)

Least Used Data-Centric Approaches

- Definition of data-centric project procurement processes, qualifications and contractual requirements (32%)
- Processes for new technology adoption (30%)
- Maintain a common library of data-rich components for models (30%)
- Well-defined data-centric selection criteria for project teams (27%)
- Have a defined change management strategy (23%)
- Automated quality control of project data (20%)
- Selecting an information champion on projects (20%)

Use of Specific Data-Centric Approaches

Opportunity: Find the right teams that are ready to be good data partners, and make requirements clear to them from the start.

Top Data-Centric Approaches

- Internal processes and requirements for the production and use of project delivery and asset data (70%)
- Investing in technology infrastructure (64%)
- Digitize asset management tasks (61%)
- Require project teams to use data standards (57%)
- Regular education/training on technology and data use (55%)
- Implemented a quality assurance process and metrics to document conformance to standards and policies on at least 50% of their projects (53%)

Least Used Data-Centric Approaches

- Definition of data-centric project procurement processes, qualifications and contractual requirements (32%)
- Processes for new technology adoption (30%)
- Maintain a common library of data-rich components for models (30%)
- Well-defined data-centric selection criteria for project teams (27%)
- Have a defined change management strategy (23%)
- Automated quality control of project data (20%)
- Selecting an information champion on projects (20%)

Use of Specific Data-Centric Approaches

Opportunity: Implement data quality assurance by automating it and having a data champion.

Top Data-Centric Approaches

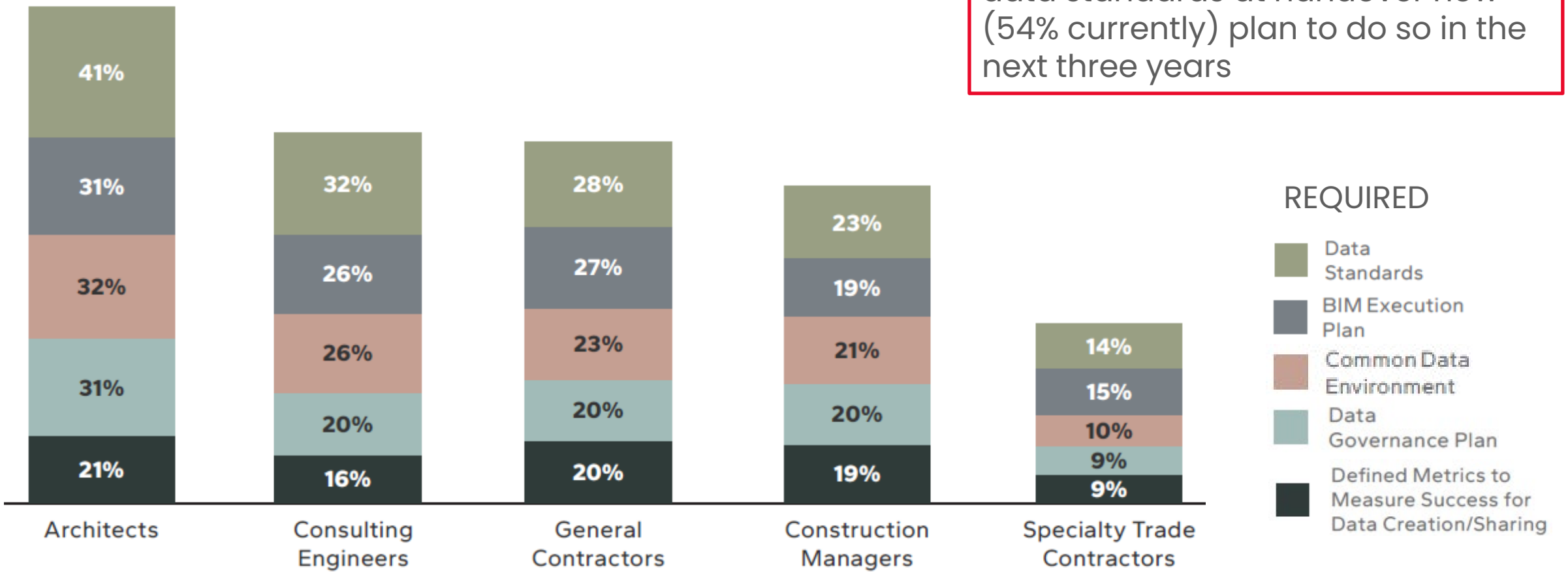
- Internal processes and requirements for the production and use of project delivery and asset data (70%)
- Investing in technology infrastructure (64%)
- Digitize asset management tasks (61%)
- Require project teams to use data standards (57%)
- Regular education/training on technology and data use (55%)
- Implemented a quality assurance process and metrics to document conformance to standards and policies on at least 50% of their projects (53%)

Least Used Data-Centric Approaches

- Definition of data-centric project procurement processes, qualifications and contractual requirements (32%)
- Processes for new technology adoption (30%)
- Maintain a common library of data-rich components for models (30%)
- Well-defined data-centric selection criteria for project teams (27%)
- Have a defined change management strategy (23%)
- Automated quality control of project data (20%)
- Selecting an information champion on projects (20%)

Owners' Data Requirements for the AEC Firms

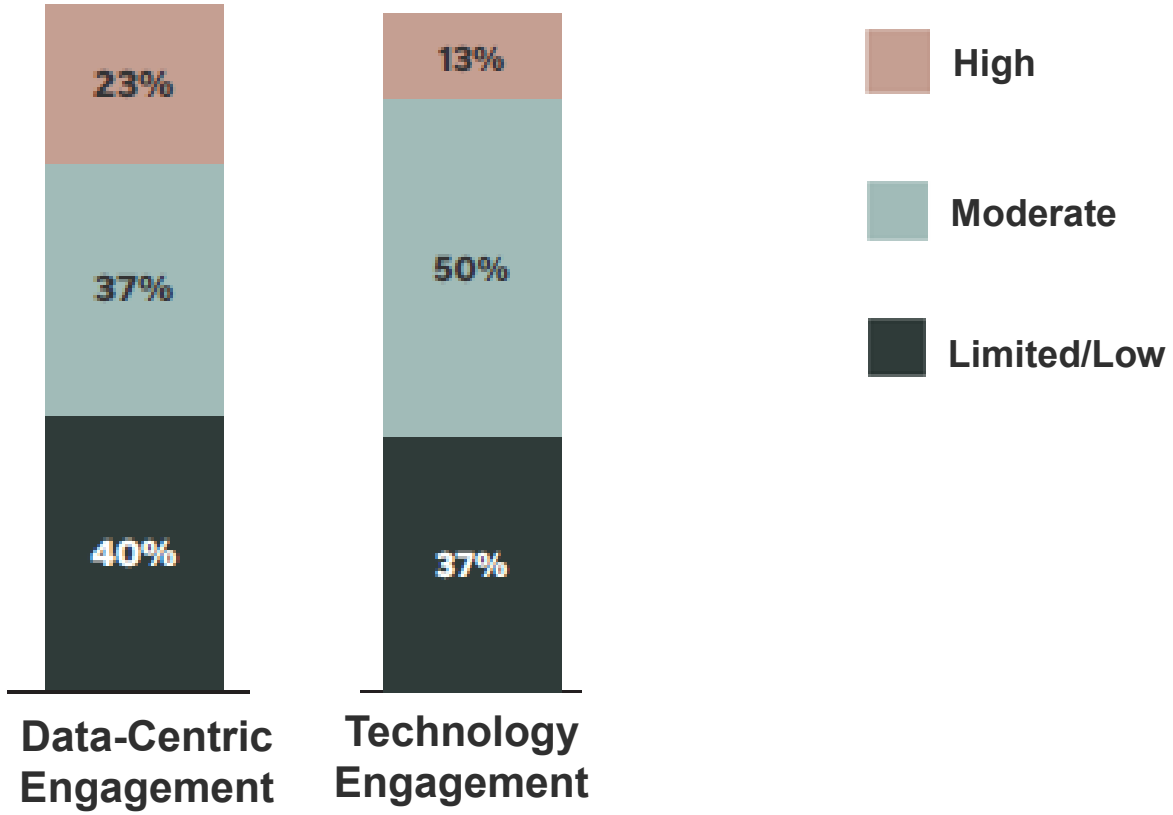
72% of those who do not require data standards at handover now (54% currently) plan to do so in the next three years



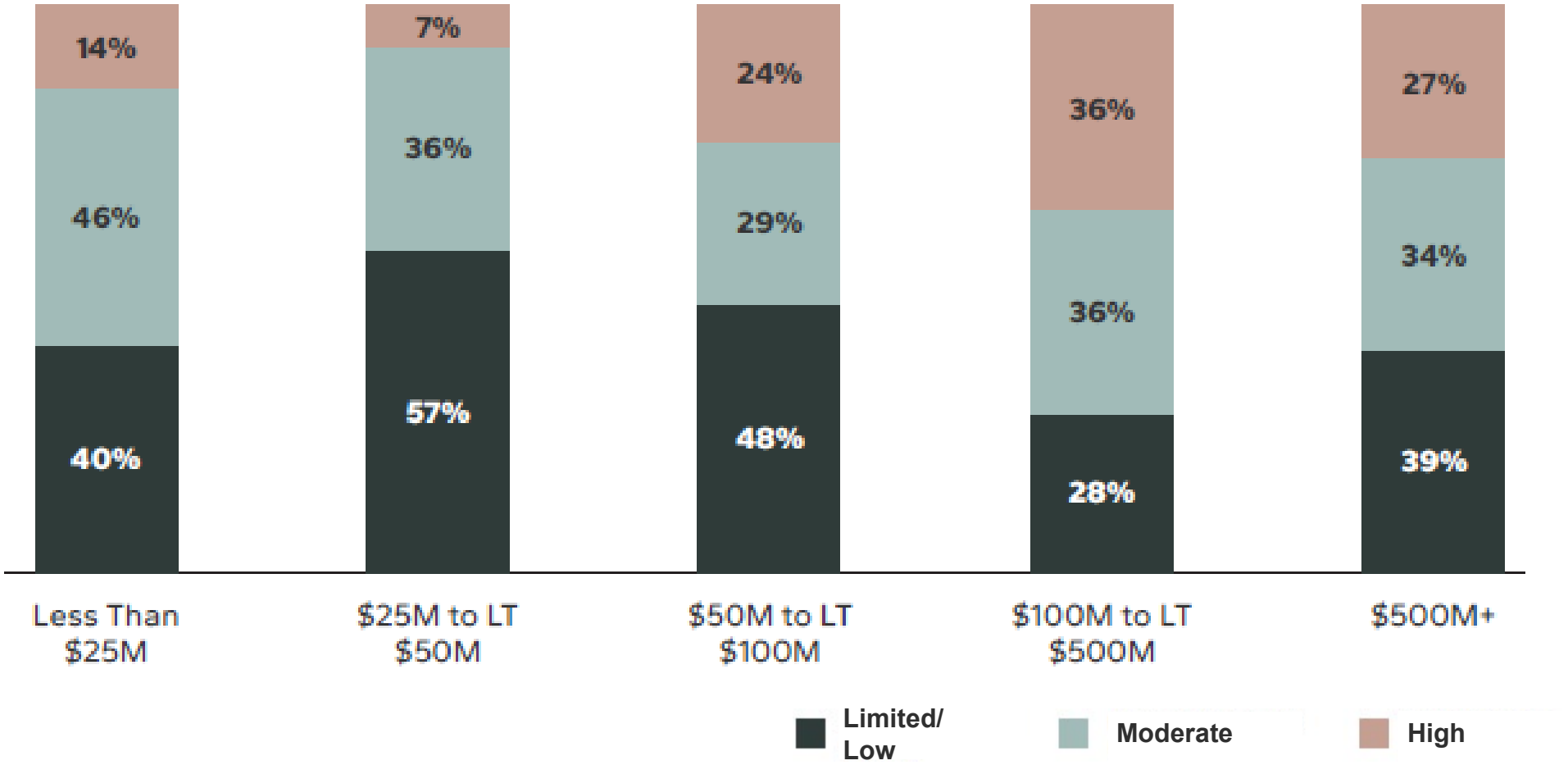
Data-Centric Engagement Index

All 42 data-centric approaches included in the study were assigned a point value, and owners are divided into the three categories based on their score:

- **Limited Engagement:** Less than 25% of total points possible
- **Moderate Engagement**: 25% to 49% of total points possible
- **High Engagement**: 50% or more of total points possible

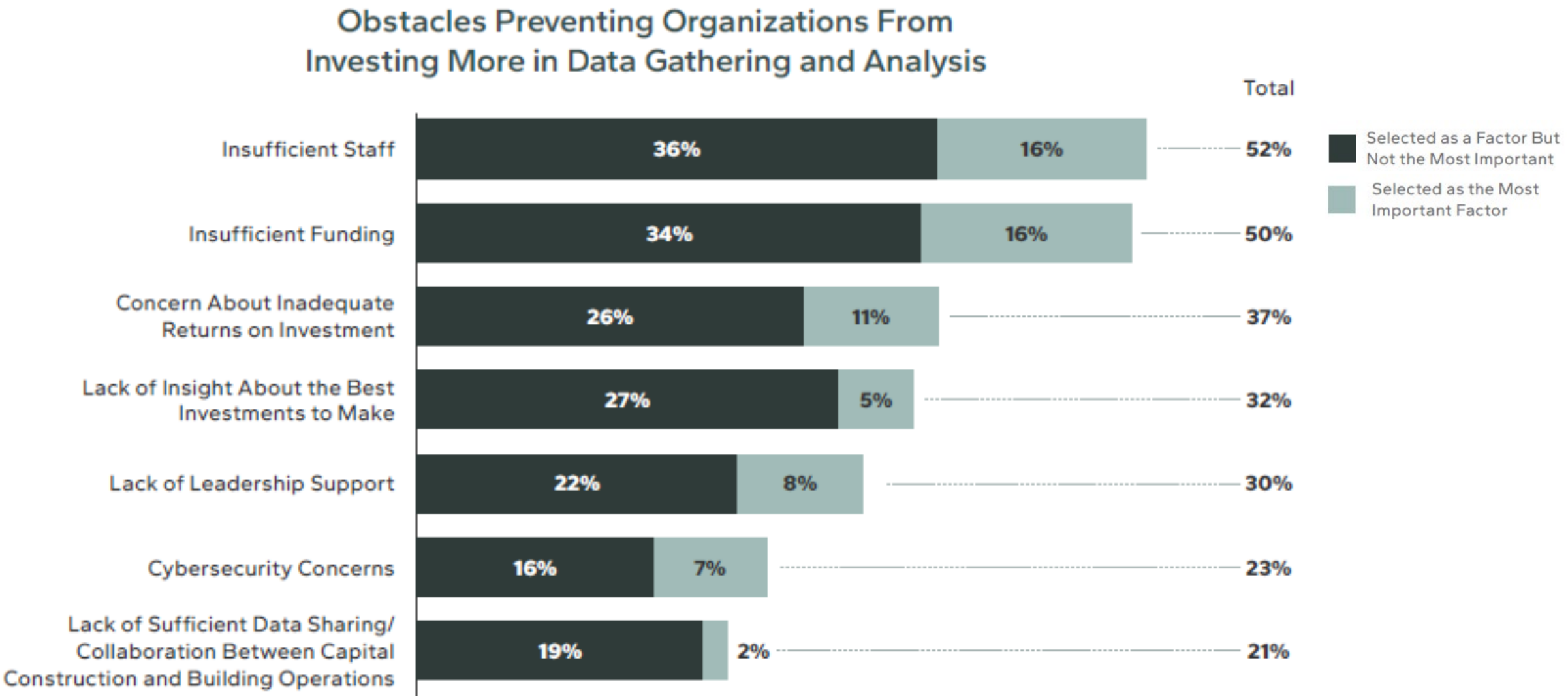


Size Is Not as Strongly Correlated With Data-Centric Engagement



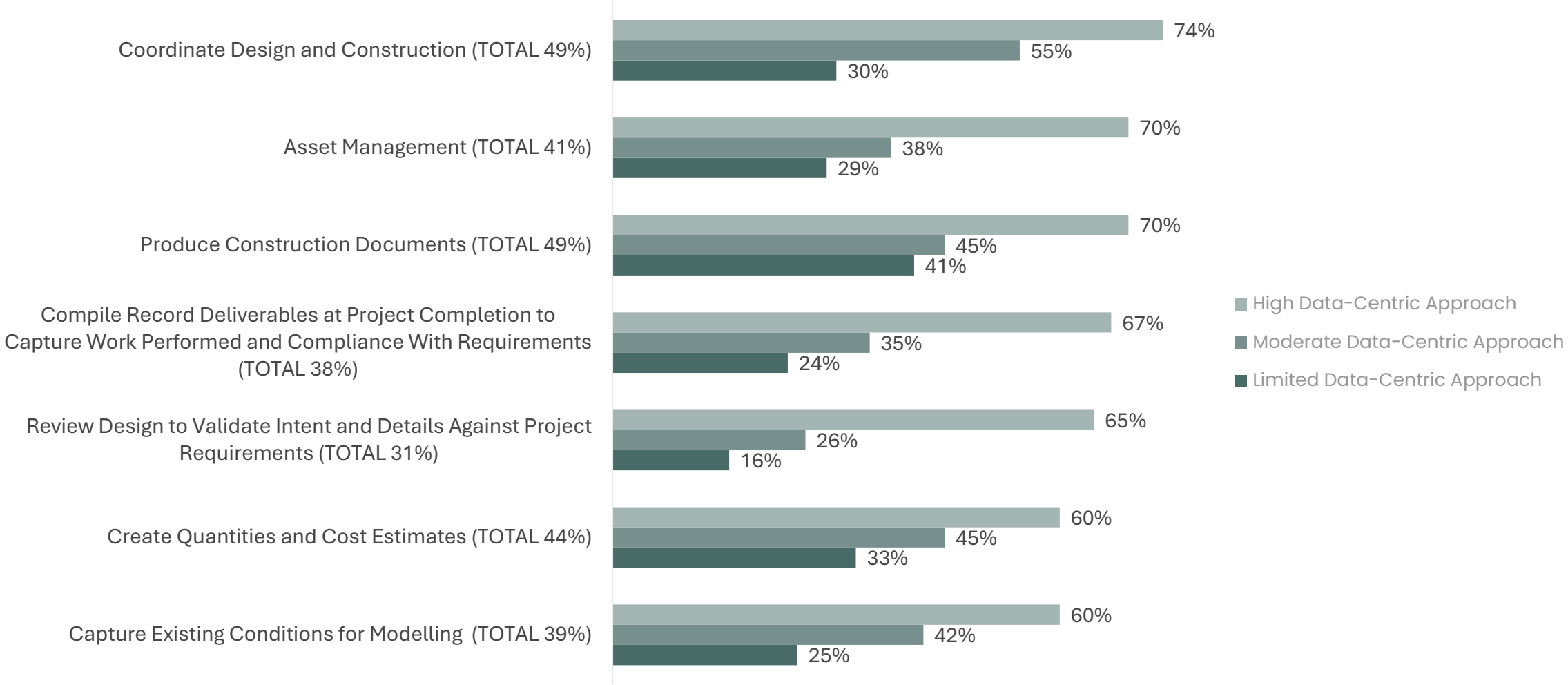
Obstacles to Wider Use of Data-Centric Approaches

Demonstrated Value Can Overcome Top Obstacles



Benefits of Digital Technology Use and Data-Centric Engagement

Data-Centric Owners Do More With Digital Tech



Top Technologies for Four Process Benefits

Share Reporting Improvements Due to Technology Use

Tracking Project Progress

1. Project Management Software (58%)
2. BIM (30%)

Transparency About Design/Construction Activities

1. Project Management Software (43%)
2. BIM (41%)

Collaboration With Project Team

1. Project Management Software (57%)
2. BIM (57%)

Convey Goals and Provide Input

1. Digital Twins (38%)
2. Project Management Software (37%)

Top Technologies for Four Process Benefits

Share Reporting Improvements Due to Technology Use

Tracking Project Progress

1. Project Management Software (58%)
2. BIM (30%)

HIGHLY DATA-CENTRIC

69%

44%

Transparency About Design/Construction Activities

1. Project Management Software (43%)
2. BIM (41%)

HIGHLY DATA-CENTRIC

60%

53%

Collaboration With Project Team

1. Project Management Software (57%)
2. BIM (57%)

67%

69%

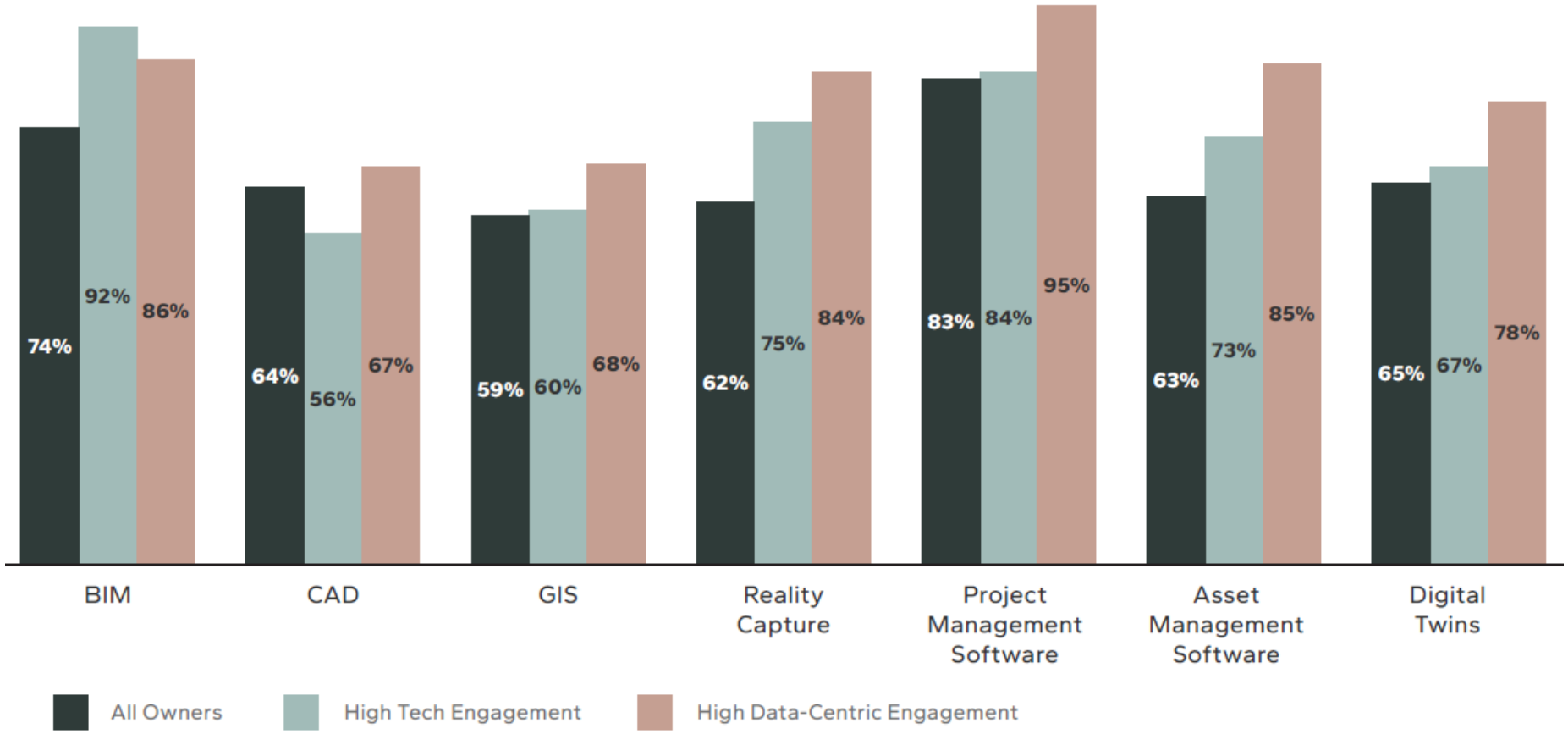
Convey Goals and Provide Input

1. Digital Twins (38%)
2. Project Management Software (37%)

44%

50%

Data Centric Owners Are More Engaged on Projects



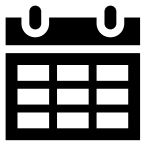
Includes at least one process improvement:

- Tracking project progress
- Greater transparency about design and construction activities
- More collaboration with the project team
- Better ability to convey goals and provide input to project team

Top Technologies for Improved Project Outcomes

Share Reporting Improvements Due to Technology Use

More Reliable Schedule



1. Project Management Software (51%)
2. BIM (35%)

More Reliable Cost Estimate

1. BIM (38%)
2. Project Management Software (36%)

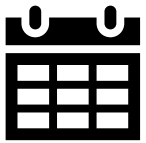
Improved Quality

1. BIM (55%)
2. Reality Capture (53%)

Top Technologies for Improved Project Outcomes

Share Reporting Improvements Due to Technology Use

More Reliable Schedule



1. Project Management Software (51%)
2. BIM (35%)

HIGHLY DATA-CENTRIC

60%

53%

More Reliable Cost Estimate

1. BIM (38%)
2. Project Management Software (36%)

HIGHLY DATA-CENTRIC

61%

52%

Improved Quality

1. BIM (55%)
2. Reality Capture (53%)

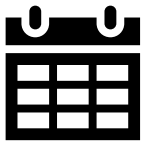
61%

65%

Top Technologies for Improved Project Outcomes

Share Reporting Improvements Due to Technology Use

More Reliable Schedule



1. Project Management Software (51%)
2. BIM (35%)

More Reliable Cost Estimate

1. BIM (38%)
2. Project Management Software (36%)

Improved Quality

1. BIM (55%)
2. Reality Capture (53%)

Improved Safety

1. Reality Capture (23%)
2. BIM (22%)

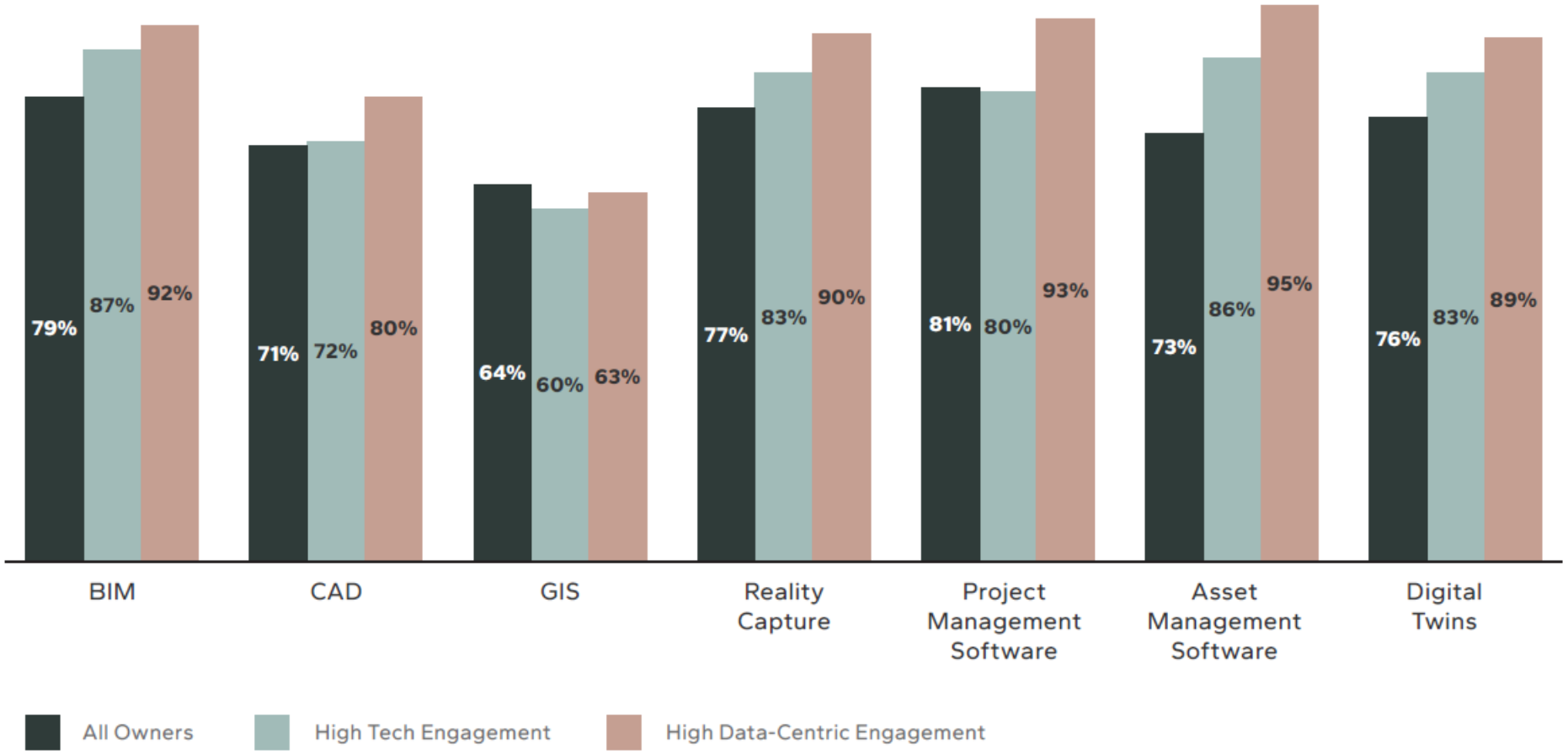
Sustainability

1. Digital Twins (35%)
2. BIM/Asset Mgmt (19%)

Asset Performance

1. Digital Twins (24%)
2. BIM/Asset Mgmt (22%)

Data-Centric Owners Have Better Project Outcomes



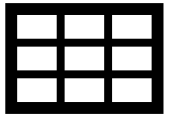
Includes at least one improved outcome from using technology:

- More reliable schedule
- More reliable cost estimates
- Improved quality
- Improved safety
- Improved sustainability
- Asset exceeds expected performance

Top Tech for Using Project Data in Other Functions

Share Reporting Improvements Due to Technology Use

Planning



1. BIM (47%)
2. CAD (42%)
3. Reality Capture (41%)

O & M

1. Digital Twins (41%)
2. Project Management Software (34%)

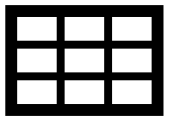
Asset Management

1. Asset Management Software (43%)
2. Digital Twins (38%)

Top Tech for Using Project Data in Other Functions

Share Reporting Improvements Due to Technology Use

Planning



1. BIM (47%) — 61%
2. CAD (42%) — 53%
3. Reality Capture (41%) — 55%

HIGHLY DATA-CENTRIC

O & M

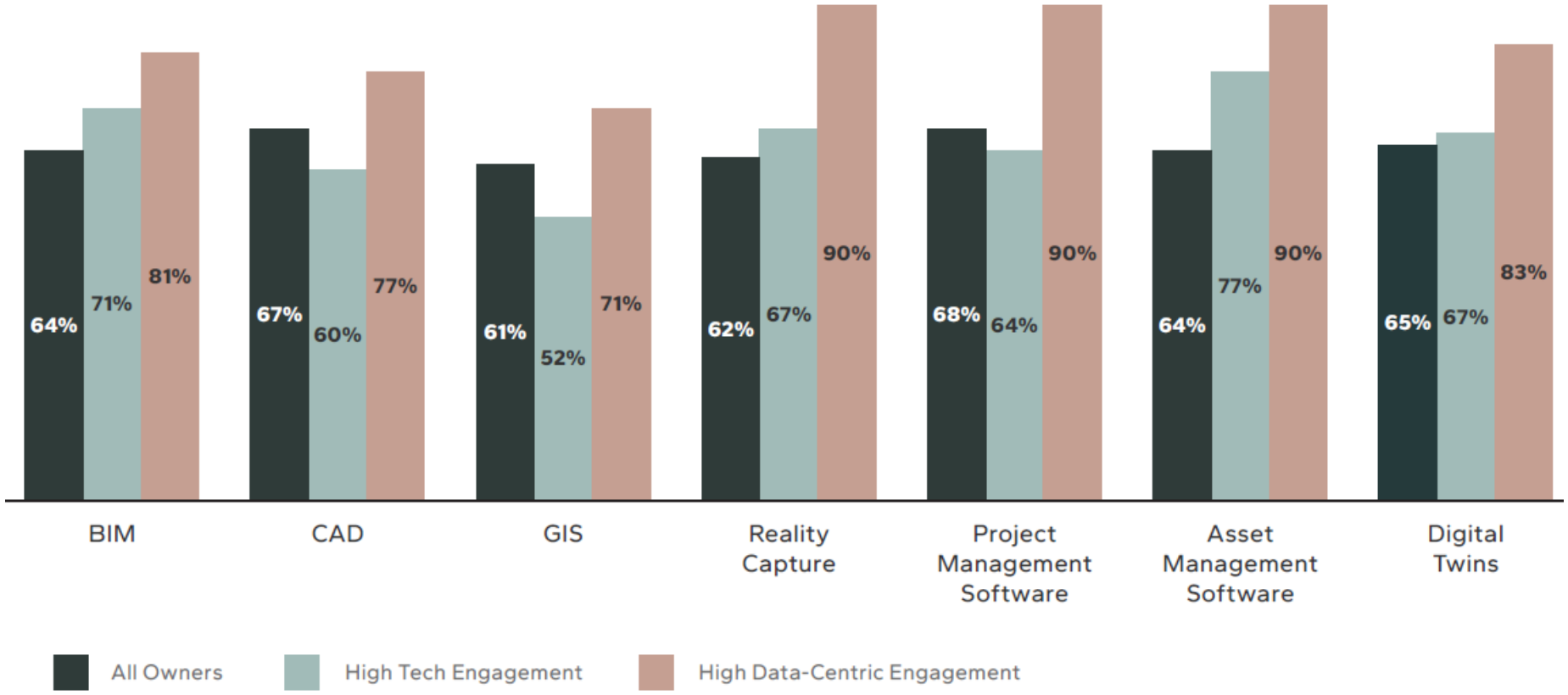
1. Digital Twins (41%) — 61%
2. Project Management Software (34%) — 48%

HIGHLY DATA-CENTRIC

Asset Management

1. Asset Management Software (43%) — 62%
2. Digital Twins (38%) — 50%

Data-Centric Owners Use Project Data More



Includes using digital deliverables for:

- Planning
- Operations and maintenance
- Asset management

Top Findings and Recommendations

Top Findings

- Owner organizations that invest in approaches that improve how they create, manage and analyze data get more from their use of technology.
  - Highly data-centric owners use more types of digital technologies (from established to emerging tech) and they are able to utilize those technologies for more of their basic planning, design, construction, operations and asset management functions.
  - Highly data-centric owners see more process benefits and more project benefits from their use of most technologies, even more than those who are highly invested in technology.
- Very large owner organizations do not have a monopoly on being data-centric. Small and midsize organizations can and have implemented many approaches that help them become more data-centric.
  - Many midsize organizations are highly data-centric, and many of the largest owner organizations fall at the lowest end of the scale.
- Owners are planning to invest in digital technology, not just for the design/construction of their assets, but for use across the asset lifecyle.

Recommendations

REPORT AVAILABLE FOR FREE DOWNLOAD:
www.construction.com/resources

Owners

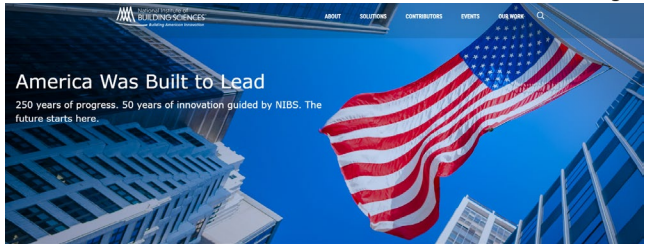
1. Commit to being a data-centric organization. To thrive, an owner needs to be as rigorous in its data management as it is in its project or asset management.
2. Data Standards need to be part of a data-centric approach.
3. Invest in processes for managing data, not just technology infrastructure.
4. Invest in the human side of data management.
5. Include improving project team data as part of the overall approach to data management.
6. Recognize that being data-centric is an ongoing process.

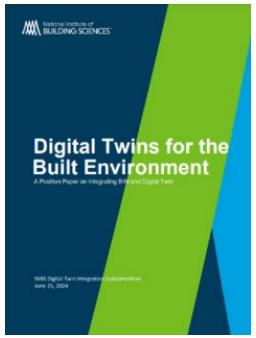
Designers and Contractors

1. Build your data management skills to help meet client demands, including familiarity with data standards, setting up good digital workflows, etc.
2. Consider how your data requirements for consultants and subcontractors need to align with your data deliverables to owners.
3. Make sure you establish the owner's data needs and requirements when you begin working on a project.
4. Be prepared to demonstrate your company's digital acumen when seeking work.

Get Involved

- National Institute of Building Sciences – www.nibs.org
- Data-centric Owner Smart Market Report – www.nibs.org/the-data-centric-owner-smartmarket-report
- NIBS Digital Technology Council – www.nibs.org/dtc
- National BIM Standard v4 – www.nibs.org/nbims
- Digital Twins in the Built Environment – www.nibs.org/digital-twins-for-the-built-environment-2





Leveraging 21st century tools and a comprehensive national network to improve lives and communities through buildings and infrastructure.

Thank you!