Donna Laquidara-Carr, PhD, LEED AP

Industry Insights Research Director
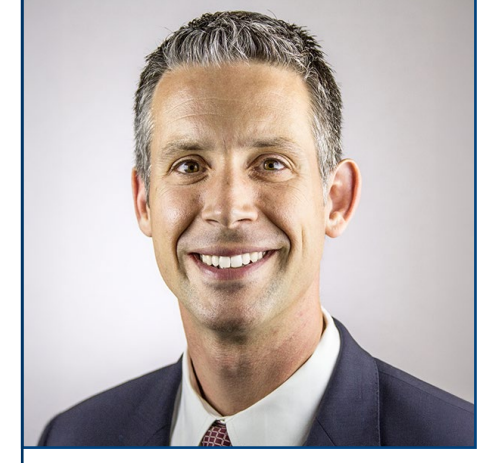**Dodge Construction Network**

Jennifer Suerth

Senior Vice President
Pepper Construction

Johnny Fortune. EdD, CDT, CM-BIM, CM-Lean, LEED AP

President & Senior Consultant
AECO Digital Technologies

Paul Ruffo

Chief Technology Officer
National Institute of Building Sciences

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%

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DODGE CONSTRUCTION NETWORK

SMARTMARKET REPORT

The Data-Centric Owner SmartMarket Report

How Owners Are Driving Digital Transformation in Design and Construction

PREMIER PARTNER — National Institute of BUILDING SCIENCES

CONTRIBUTING PARTNERS — AUTODESK, esri, Trimble

RESEARCH PARTNERS — ARTBA, COAA, CURT, DBIA, infotech, Lean Construction Institute

Owner Engagement With Digital Technologies

Study Measured Engagement With 7 Technologies

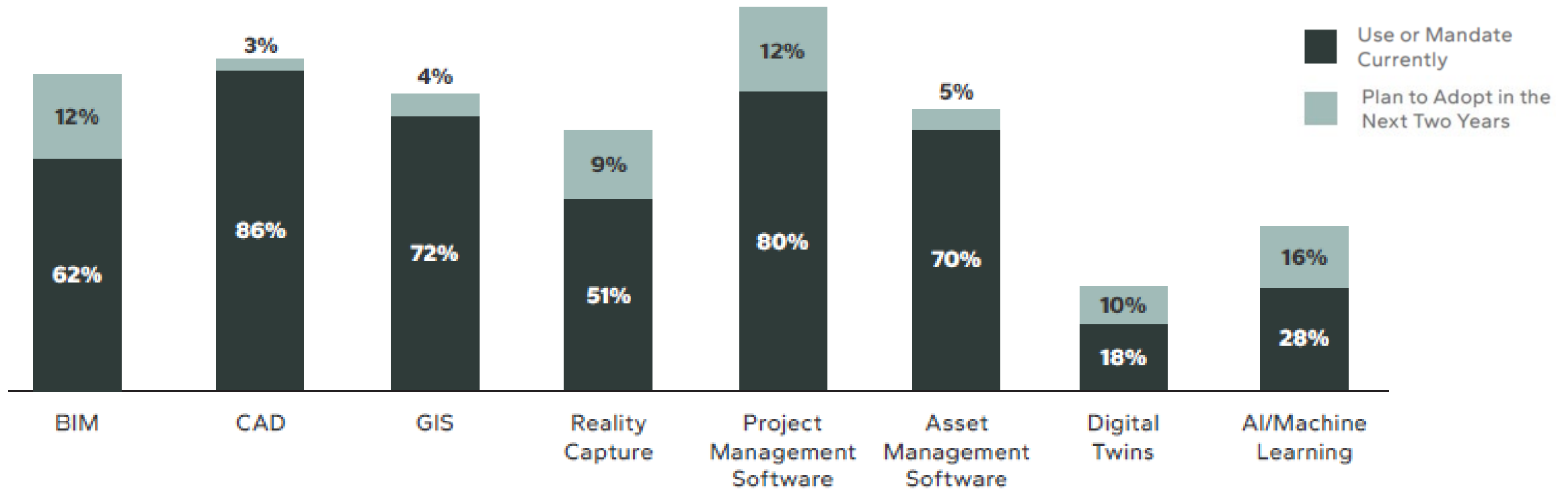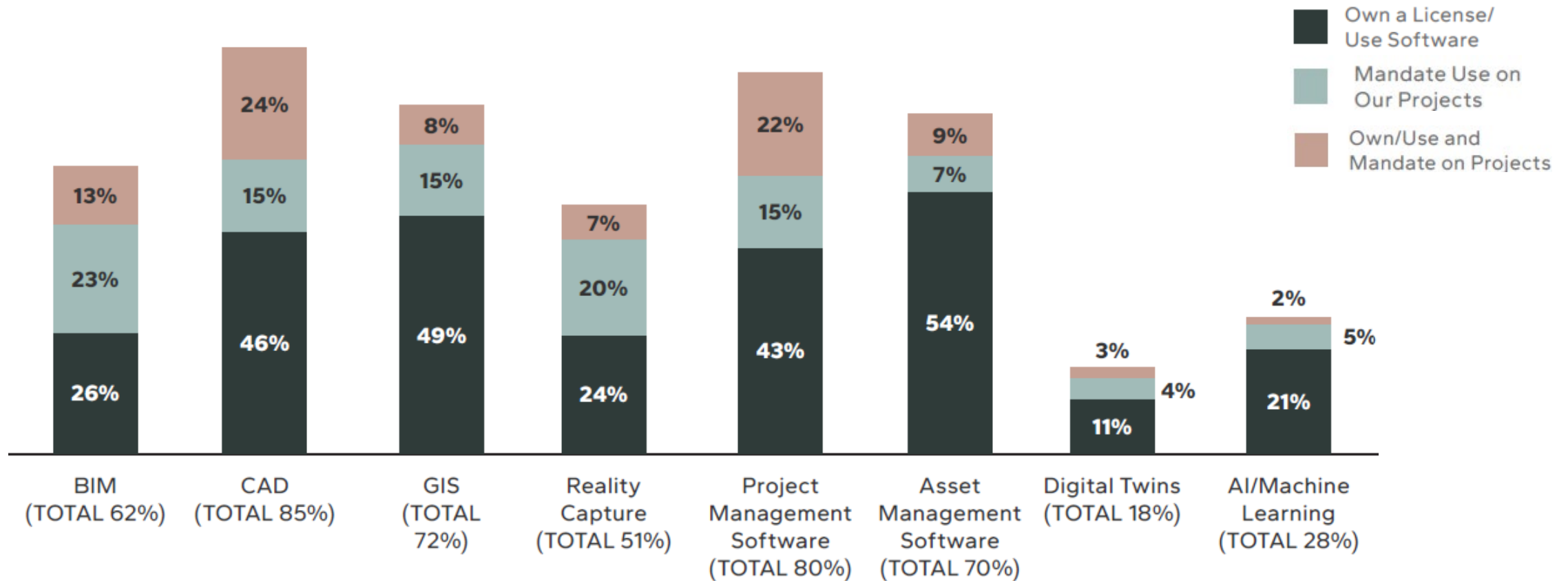| BIM	CAD	GIS	Reality Capture	Project Management Software	Asset Management Software	Digital Twins	AI/Machine Learning

Most Own the Tech Used on Their Projects

Legend:
- Own a License/Use Software
- Mandate Use on Our Projects
- Own/Use and Mandate on Projects

Technology	Own a License/Use Software	Mandate Use on Our Projects	Own/Use and Mandate on Projects
BIM (TOTAL 62%)	26%	23%	13%
CAD (TOTAL 85%)	46%	15%	24%
GIS (TOTAL 72%)	49%	15%	8%
Reality Capture (TOTAL 51%)	24%	20%	7%
Project Management Software (TOTAL 80%)	43%	15%	22%
Asset Management Software (TOTAL 70%)	54%	7%	9%
Digital Twins (TOTAL 18%)	11%	4%	3%
AI/Machine Learning (TOTAL 28%)	21%	5%	2%

Less Than Half Use for Specific Activities

Planning and Design	Design/ Model Analysis	Construction	Operations/Asset Mgmt
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%	

Owner Engagement With Data

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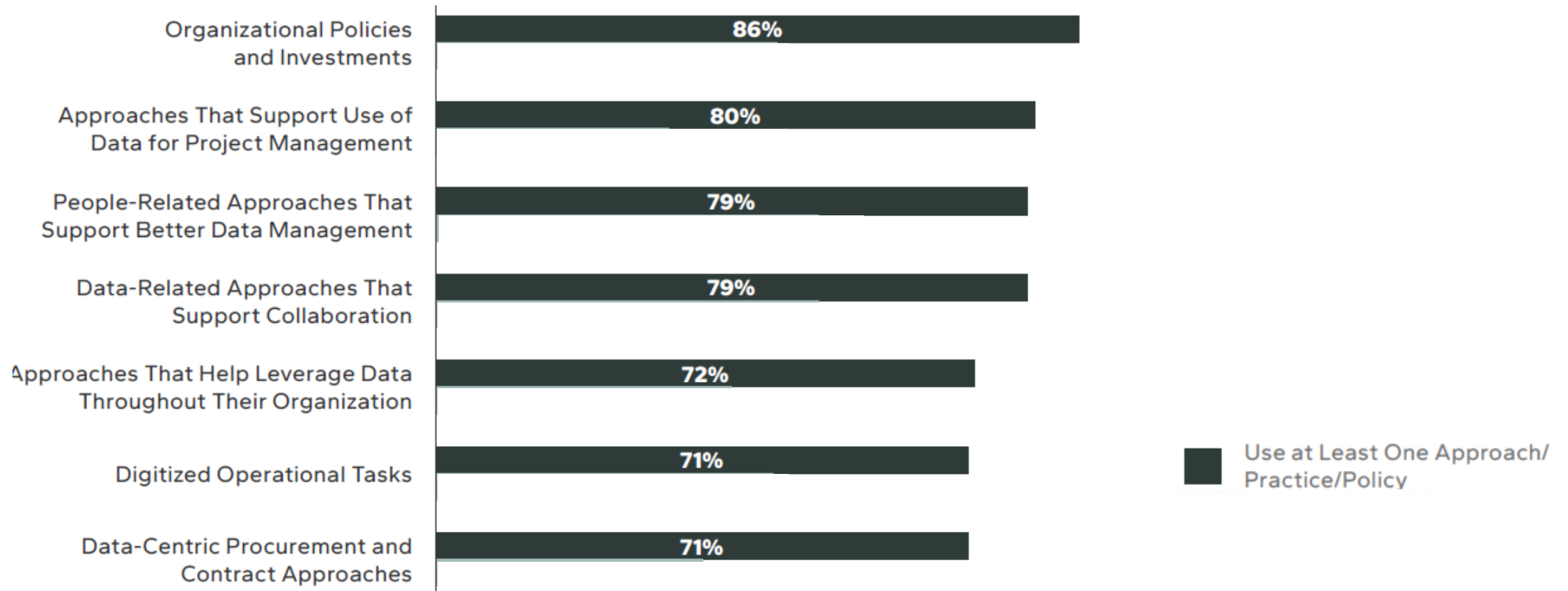
Data-Centric Procurement and Contracts
- Contractual documents supporting data-centric project delivery
- Well-defined digital delivery requirements
- Procurement strategies supporting data-centric project delivery
- Data-centric selection criteria for project teams

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

Owners Engaging With Data

Organizational Policies and Investments	86%
Approaches That Support Use of Data for Project Management	80%
People-Related Approaches That Support Better Data Management	79%
Data-Related Approaches That Support Collaboration	79%
Approaches That Help Leverage Data Throughout Their Organization	72%
Digitized Operational Tasks	71%
Data-Centric Procurement and Contract Approaches	71%

■ Use at Least One Approach/ Practice/Policy

Owners Engaging With Data But Can Do More

Organizational Policies and Investments — 86% / 48%
Approaches That Support Use of Data for Project Management — 80% / 31%
People-Related Approaches That Support Better Data Management — 79% / 51%
Data-Related Approaches That Support Collaboration — 79% / 51%
Approaches That Help Leverage Data Throughout Their Organization — 72% / 39%
Digitized Operational Tasks — 71% / 45%
Data-Centric Procurement and Contract Approaches — 71% / 36%

Legend:
- Use at Least One Approach/Practice/Policy
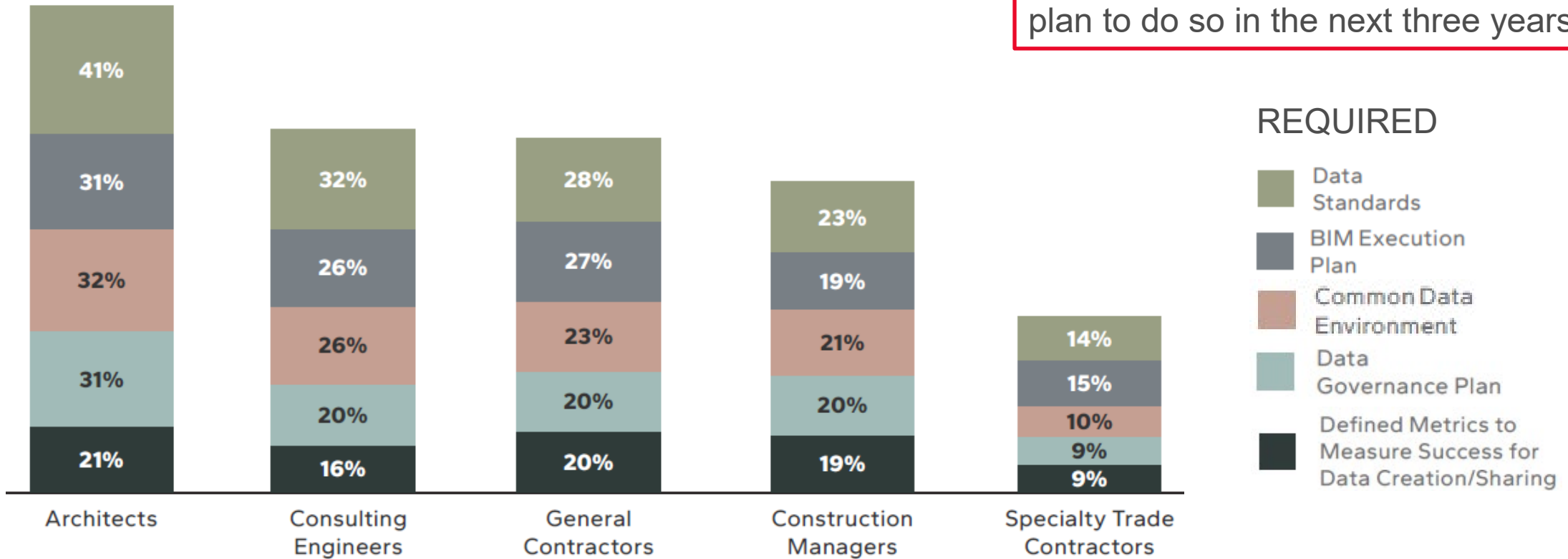- Average Share Using Them

Top Six Data-Centric Practices Used by Owners

1. Internal processes and requirements for the production and use of project delivery and asset data (70%) ⬅

2. Investing in technology infrastructure (64%)

3. Digitize asset management tasks (61%)

4. Require project teams to use data standards (57%) ⬅

5. Regular education/training on technology and data use (55%)

6. Implemented a quality assurance process and metrics to document conformance to standards and policies on at least 50% of their projects (53%) ⬅
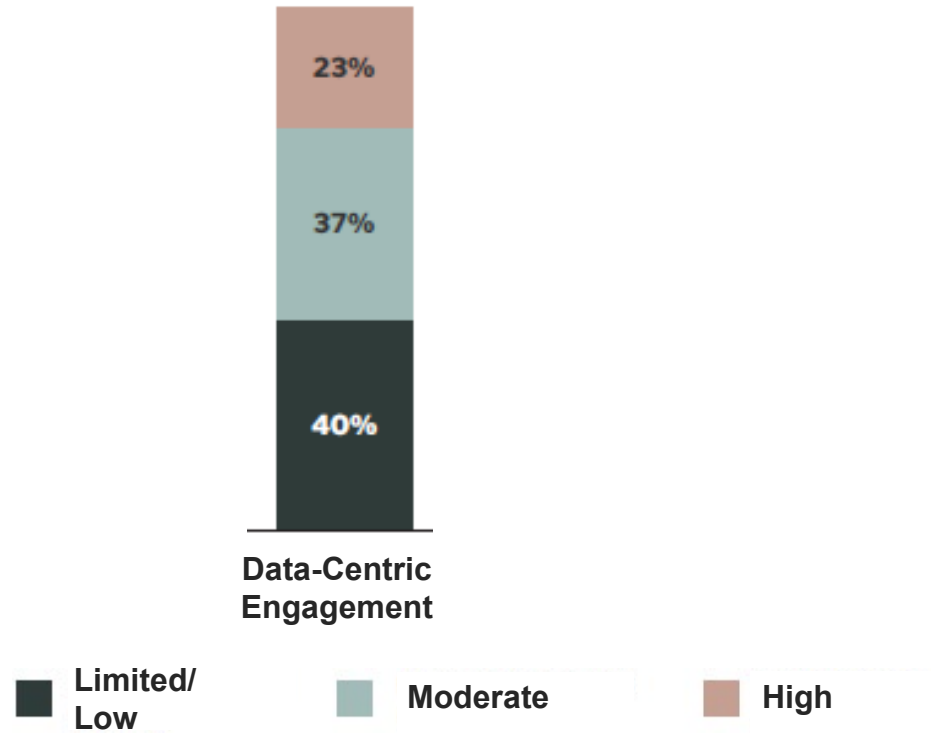
Current Data Requirements

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

REQUIRED

- Data Standards
- BIM Execution Plan
- Common Data Environment
- Data Governance Plan
- Defined Metrics to Measure Success for Data Creation/Sharing

Architects: 41%, 31%, 32%, 31%, 21%
Consulting Engineers: 32%, 26%, 26%, 20%, 16%
General Contractors: 28%, 27%, 23%, 20%, 20%
Construction Managers: 23%, 19%, 21%, 20%, 19%
Specialty Trade Contractors: 14%, 15%, 10%, 9%, 9%

Data Centric Engagement Index

Data Centric Engagement Index

Data-Centric Engagement:
- Limited/Low: 40%
- Moderate: 37%
- High: 23%

Technology Engagement:
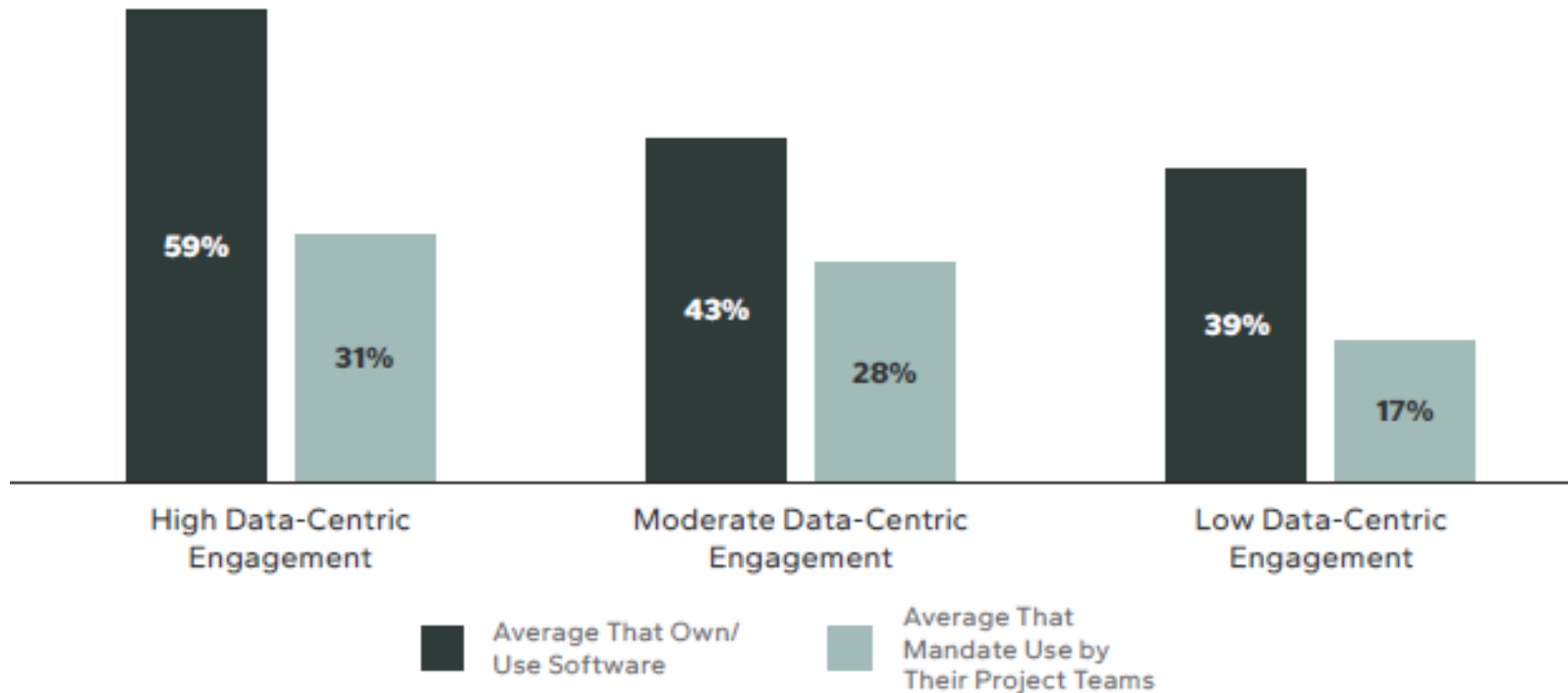- Limited/Low: 37%
- Moderate: 50%
- High: 13%

Legend: Limited/Low, Moderate, High
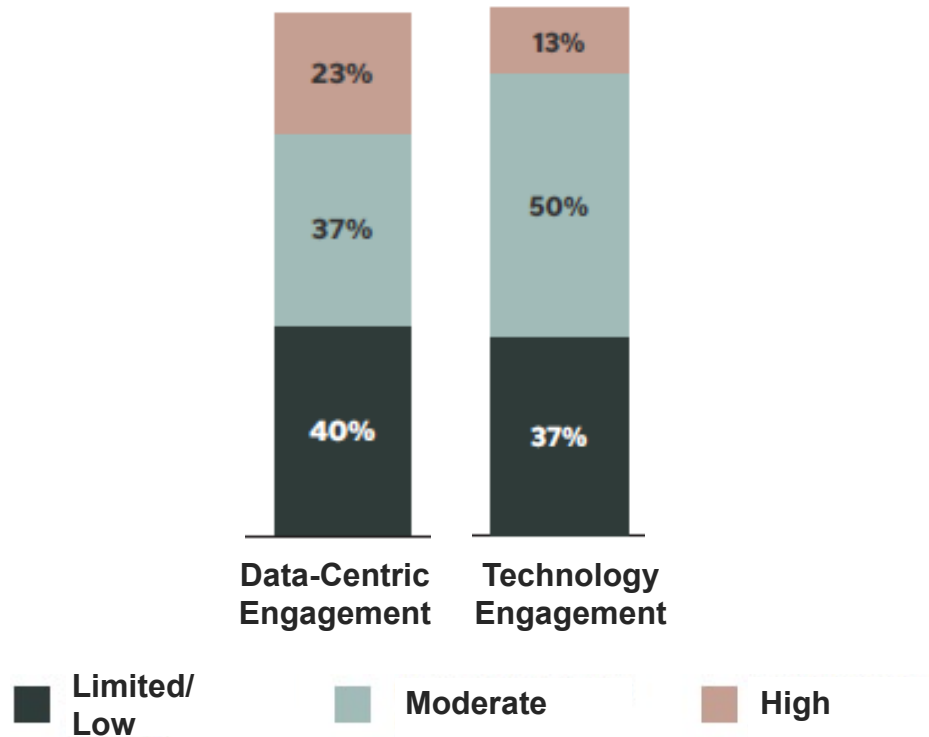
Impact of Technology Use and Data-Centric Engagement

Data-Centric Owners Use More Digital Tech

Use or Require Use of Technology (By Level of Data Centric Engagement)

High Data-Centric Engagement: 59% Average That Own/Use Software, 31% Average That Mandate Use by Their Project Teams

Moderate Data-Centric Engagement: 43% Average That Own/Use Software, 28% Average That Mandate Use by Their Project Teams

Low Data-Centric Engagement: 39% Average That Own/Use Software, 17% Average That Mandate Use by Their Project Teams

Average That Own/Use Software

Average That Mandate Use by Their Project Teams

Data-Centric Owners Do More With Their Digital Tech
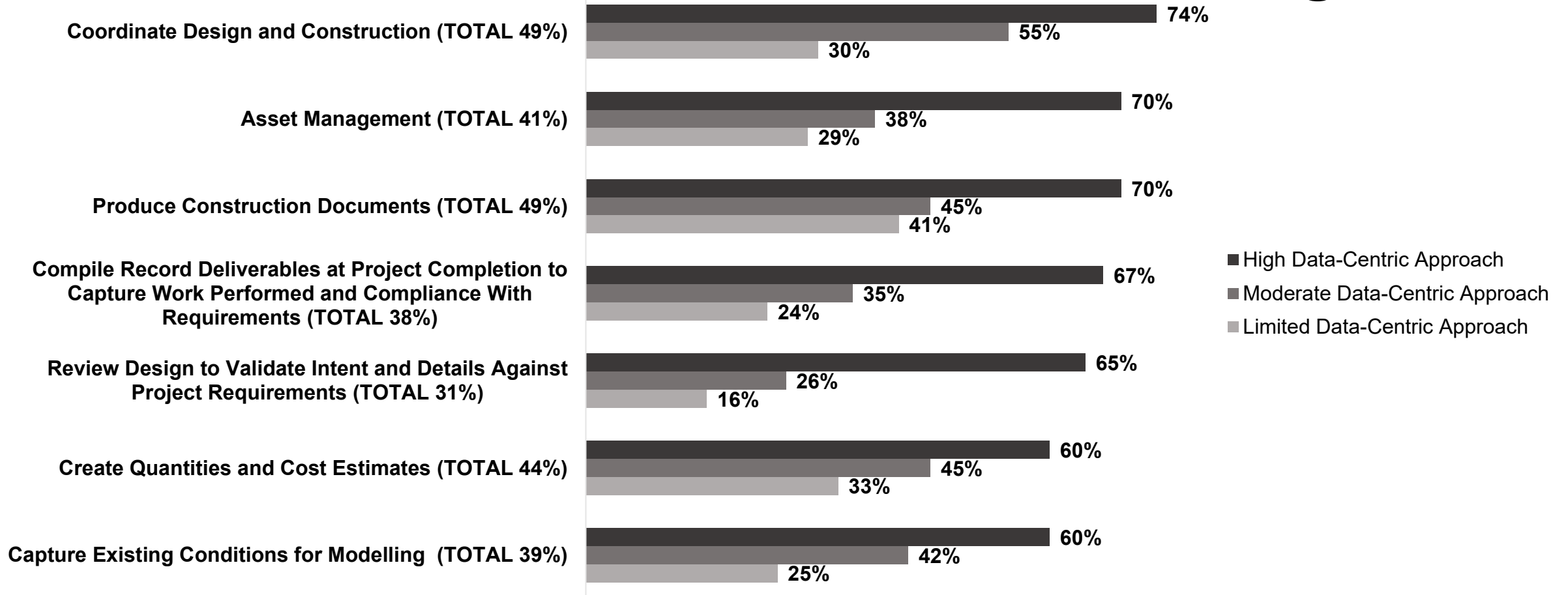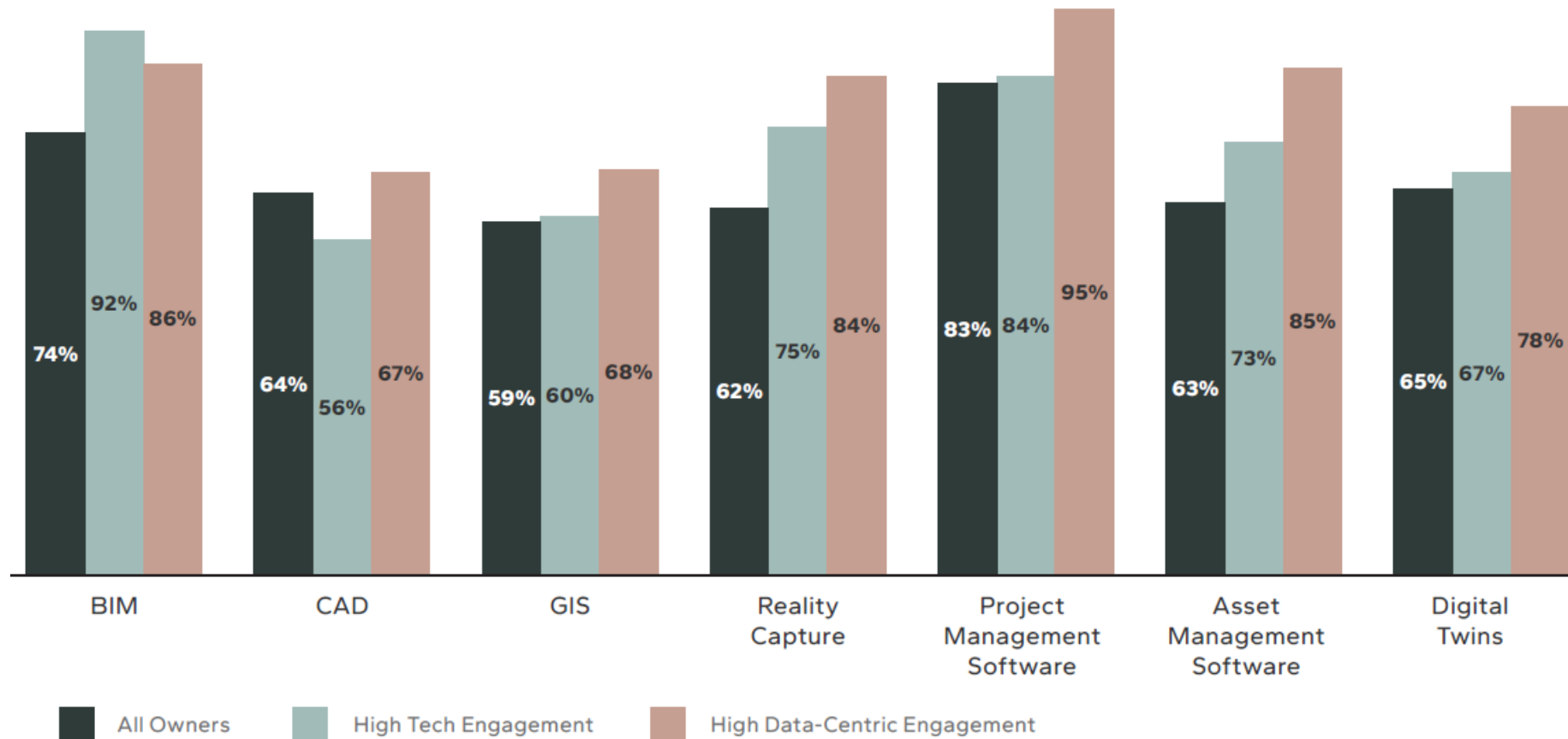
Coordinate Design and Construction (TOTAL 49%)
- 74%
- 55%
- 30%

Asset Management (TOTAL 41%)
- 70%
- 38%
- 29%

Produce Construction Documents (TOTAL 49%)
- 70%
- 45%
- 41%

Compile Record Deliverables at Project Completion to Capture Work Performed and Compliance With Requirements (TOTAL 38%)
- 67%
- 35%
- 24%

Review Design to Validate Intent and Details Against Project Requirements (TOTAL 31%)
- 65%
- 26%
- 16%

Create Quantities and Cost Estimates (TOTAL 44%)
- 60%
- 45%
- 33%

Capture Existing Conditions for Modelling (TOTAL 39%)
- 60%
- 42%
- 25%

Legend:
- High Data-Centric Approach
- Moderate Data-Centric Approach
- Limited Data-Centric Approach

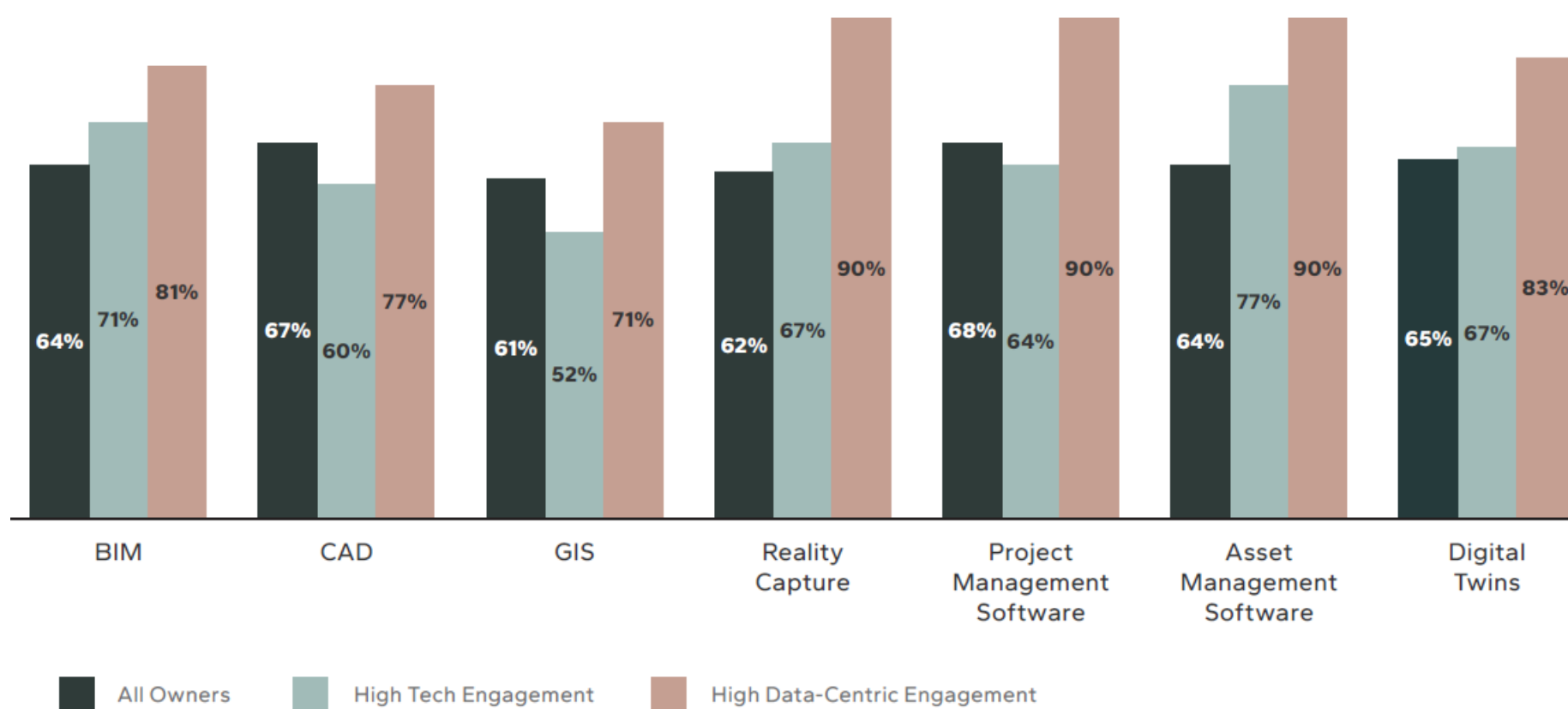# Data-Centric Owners Have Better Project Outcomes
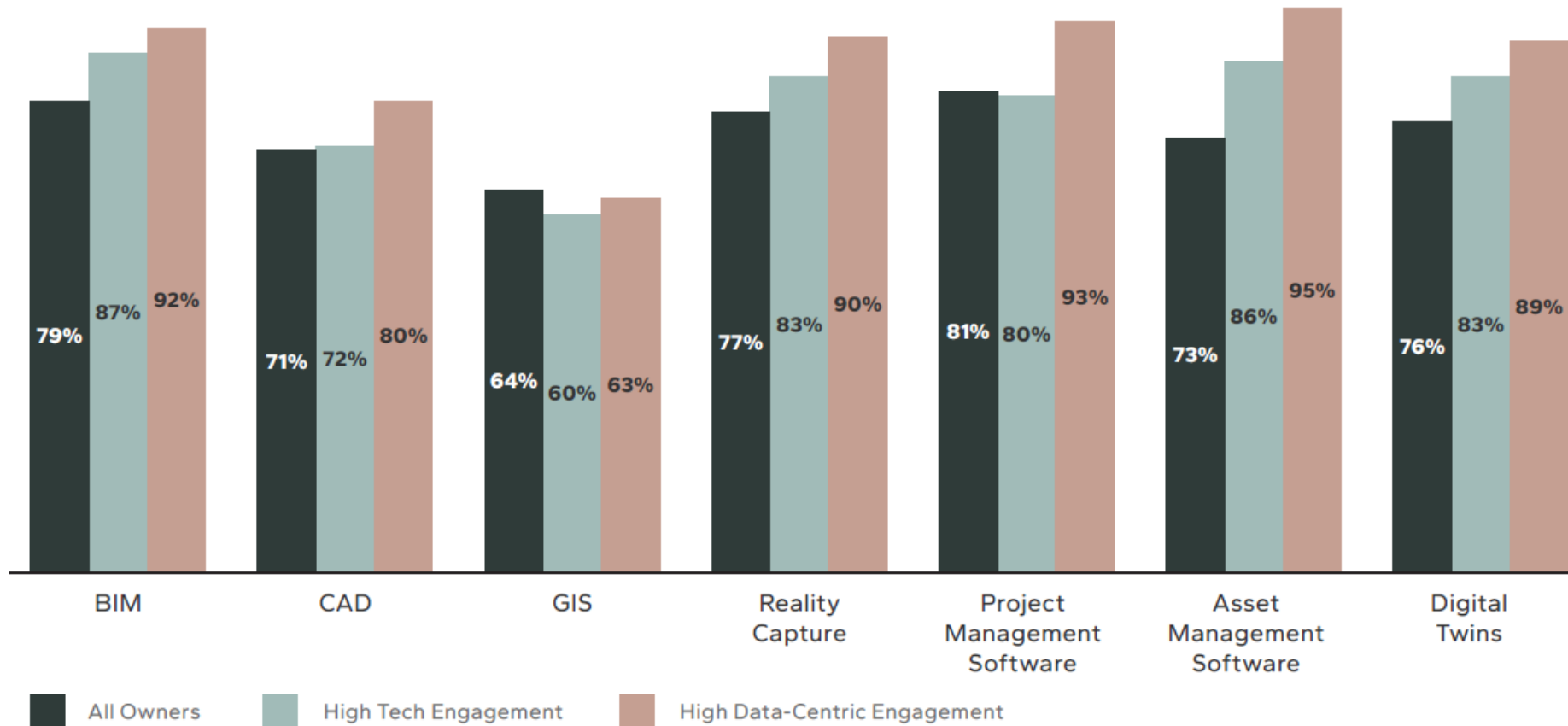
Includes at least one improved outcome from using technology:
- More reliable schedule
- More reliable cost estimates
- Improved quality
- Improved safety
- Improved sustainability
- Asset exceeds expected performance

Chart data:

Technology	All Owners	High Tech Engagement	High Data-Centric Engagement
BIM	79%	87%	92%
CAD	71%	72%	80%
GIS	64%	60%	63%
Reality Capture	77%	83%	90%
Project Management Software	81%	80%	93%
Asset Management Software	73%	86%	95%
Digital Twins	76%	83%	89%

Legend: All Owners, High Tech Engagement, High Data-Centric Engagement

Data-Centric Owners Use Their Project Data More

Chart data:

Category	All Owners	High Tech Engagement	High Data-Centric Engagement
BIM	64%	71%	81%
CAD	67%	60%	77%
GIS	61%	52%	71%
Reality Capture	62%	67%	90%
Project Management Software	68%	64%	90%
Asset Management Software	64%	77%	90%
Digital Twins	65%	67%	83%

Legend:
- All Owners
- High Tech Engagement
- High Data-Centric Engagement

Includes using digital deliverables for:
- Planning
- Operations and maintenance
- Asset management

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Recommendations

Recommendations for Contractors

- Build your data management skills to help meet client demands, including familiarity with data standards, setting up good digital workflows, etc.

- Consider how your data requirements for consultants and subcontractors need to align with your data deliverables to owners.

- Make sure you establish the owner's data needs and requirements when you begin working on a project.

- Be prepared to demonstrate your company's digital acumen when seeking work.

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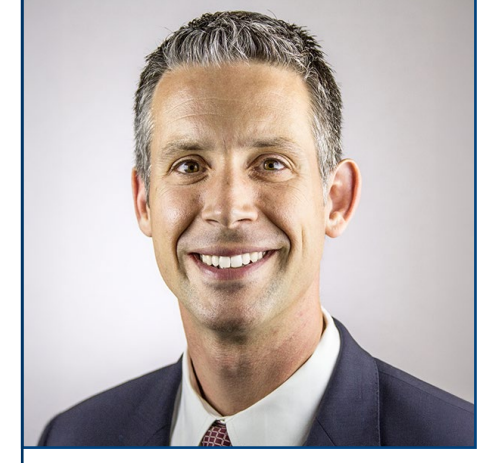Industry Insights Research Director **Dodge Construction Network**

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Questions