



MCAA | NECA | SMACNA
2025 MEP
INNOVATION CONFERENCE

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From Data to Action: *Understanding MEP Technology Use*

Steve Jones

Donna Laquidara-Carr

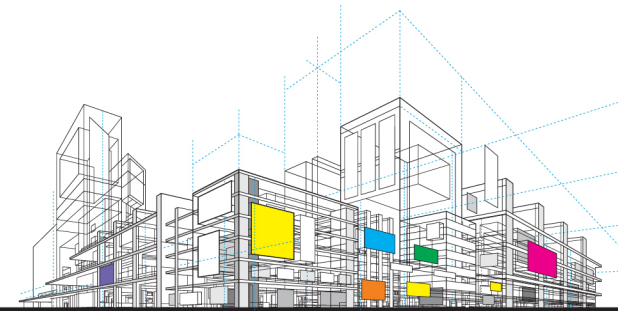
Industry Insights Research

Dodge Construction Network



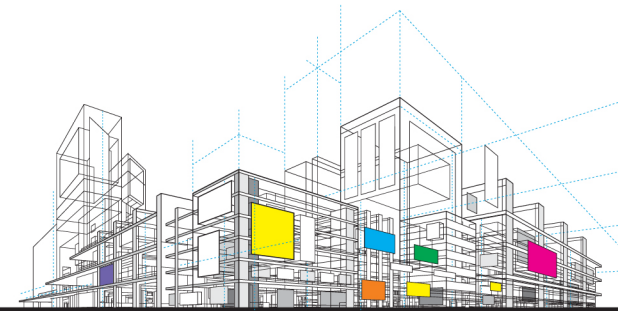
Steve Jones

- BA: Johns Hopkins University; MBA: Wharton
- 6 years: Construction, Design-Build
- 19 years: Architecture/Engineering
 - *Principal at a major A/E (now Stantec)*
- 4 years: Construction Technology
 - *Vice President, Primavera Systems (now Oracle)*
- 22 years: Dodge
 - *Industry Insights Research*



Donna Laquidara-Carr

- BA: Middlebury College; MA: Boston University; PhD: Tulane University
- Started at Dodge in 1988
 - News Gatherer
 - Team Manager
 - Analytics Group
 - Policy and Training Manager
- LEED AP: 2009
- Joined the Industry Insights Group in 2010



Dodge Industry Insights Research

Dozens of **Free** Research Reports on Technology and Other Key Trends
[construction.com/resources](https://www.construction.com/resources)

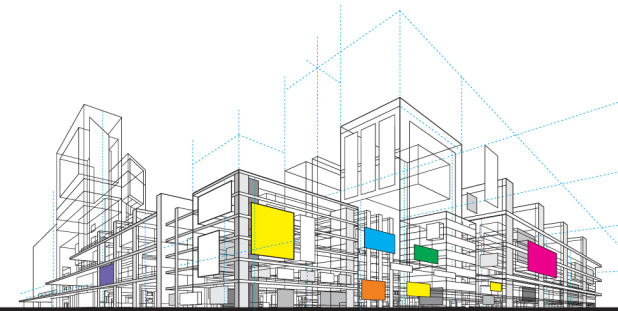


Who's Doing What
and
What's Working Best



Agenda

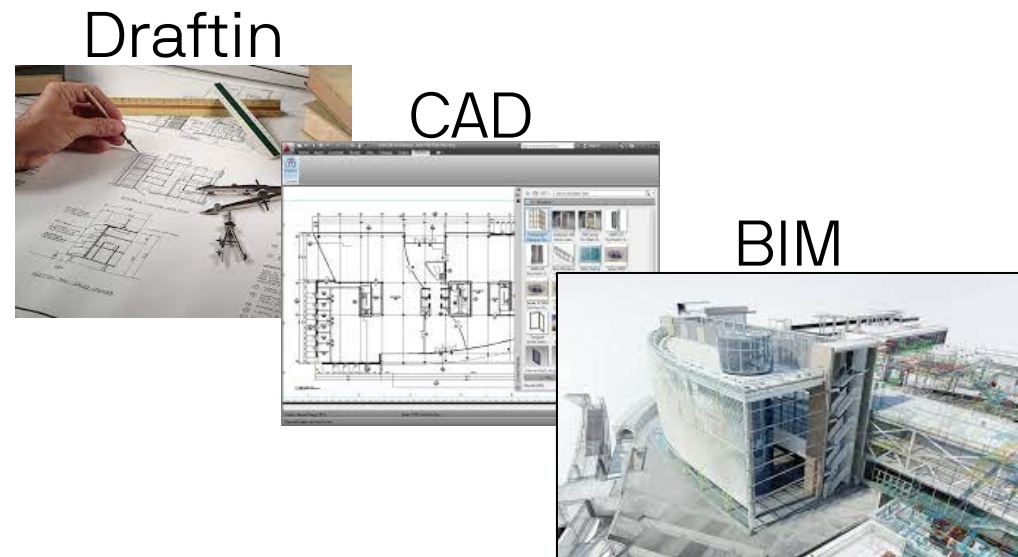
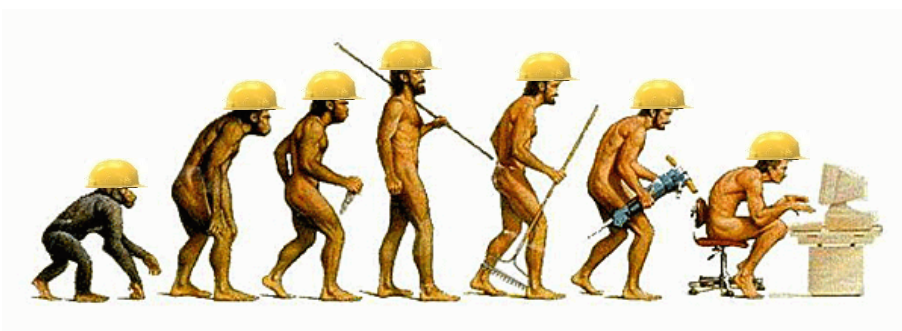
- Overview of Digital Transformation
- Highlights of New Research for MCAA, NECA, SMACNA
 - *Study Demographics*
 - *Use and Implementation of Technology*
 - *Using Data*
 - *Company Engagement With Technology*



Digital Transformation of the Construction Industry

Digital Journey

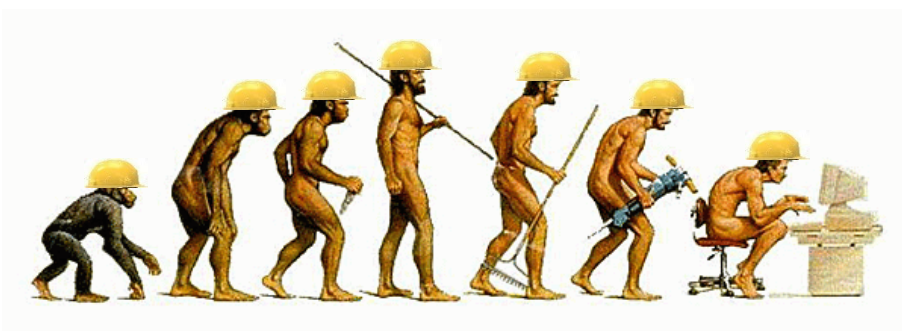
Manual **➔** Automated



Digital Transformation of the Construction Industry

Digital Journey

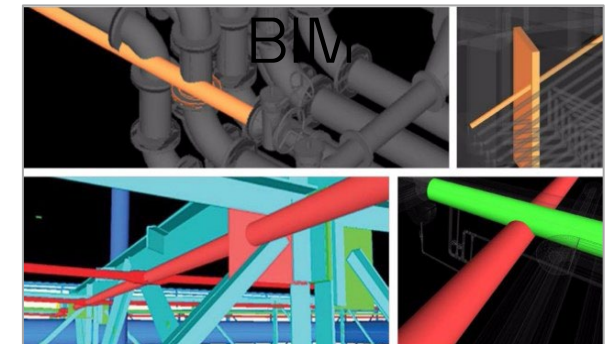
Manual **➔** Automated



Coordination
on light tables



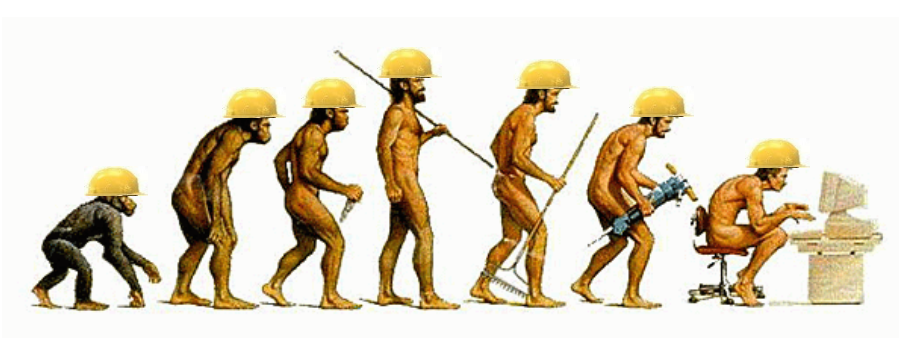
Visual clash
detection with



Digital Transformation of the Construction Industry

Digital Journey

Manual **➔** Automated



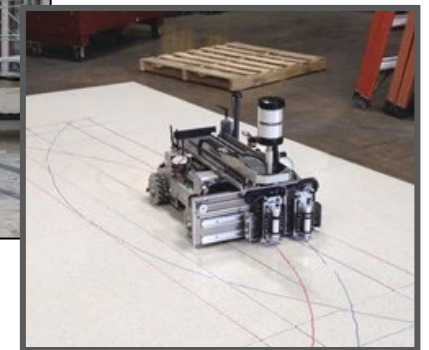
Manual layout
with chalk



Laser-
guided
layout



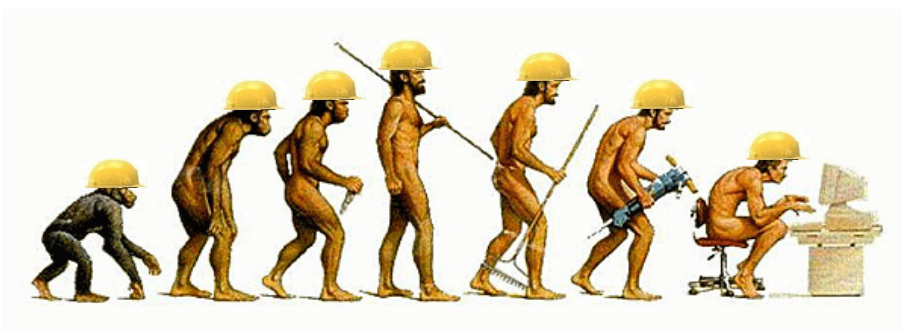
Robotic
layout



Digital Transformation of the Construction Industry

Digital Journey

Manual **➔** Automated



- Single purpose/function
- Single user/company-type
- Proprietary data formats
- Not “connecting” the ecosystem



Silos of Excellence
(aka “Digital Fiefdoms”)

Digital Transformation of the Construction Industry

Digital Journey

Manual → Automated → Digital



Integrated,
Connected
and
Collaborative

Digital Transformation of the Construction Industry

Integrated Digital Multiparty Workflows

Survey: 954 architects, engineers, general contractors, specialty trade contractors and owners

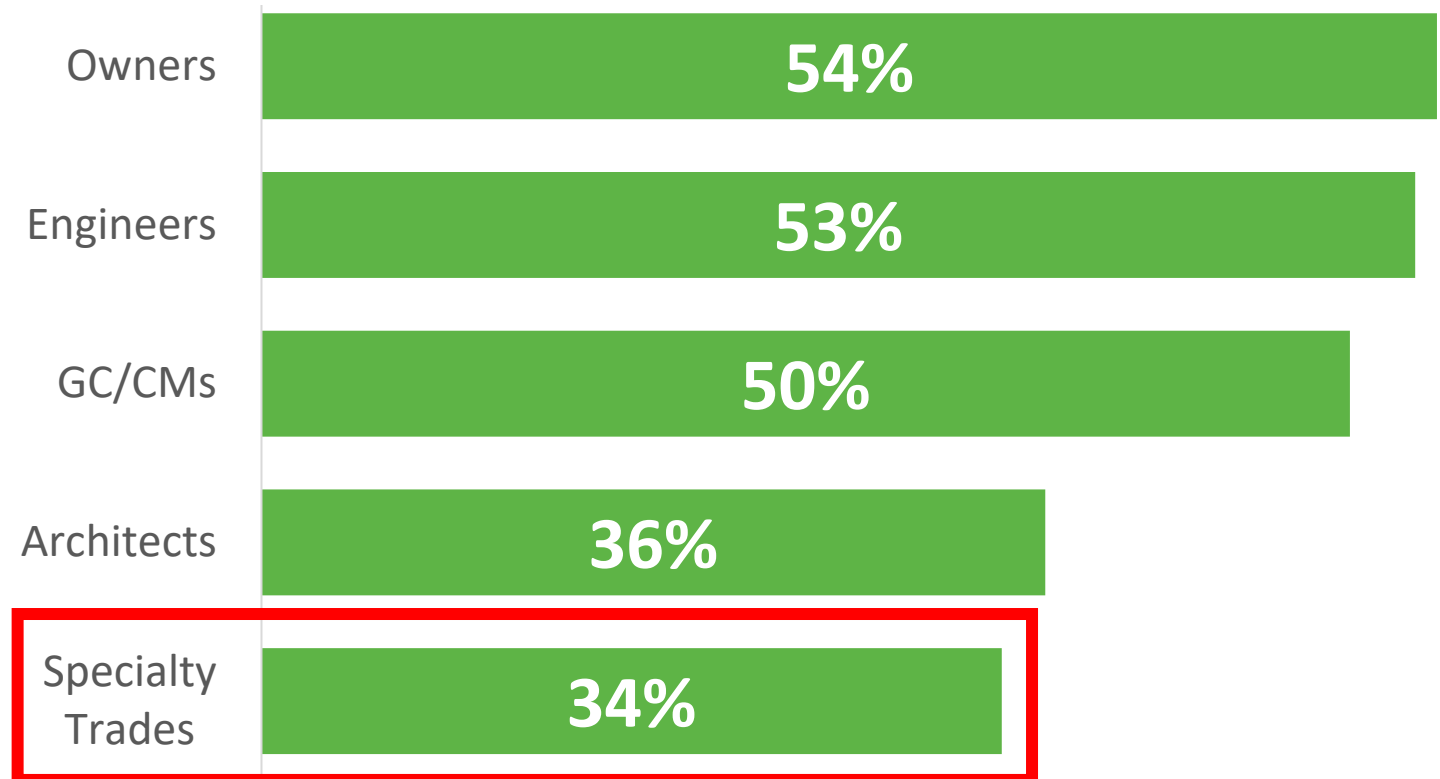


Digital Transformation of the Construction Industry

Specialty trades report the lowest use of technology that enables digital workflows (*internal or external*)

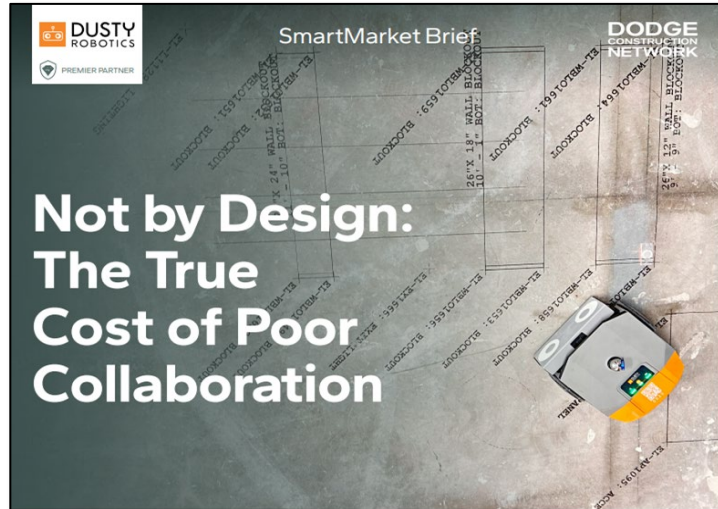
High/Very High Engagement With Technology for Conducting Digital Workflows

By Company Type



Digital Transformation of the Construction Industry

Technology-Enabled Collaboration on Jobsites



Based on a survey of several hundred contractors

- General Contractors
- Specialty Trade Contractors
 - Mechanical Contractors: 26%
 - Electrical Contractors: 28%
 - Plumbing Contractors: 27%
 - Framing Contractors: 19%
- Size Range
 - \$10M to Less Than \$20M: 22%
 - \$20M to Less Than \$50M: 25%
 - \$50M to Less Than \$100M: 20%
 - \$100M or More: 33%



10%

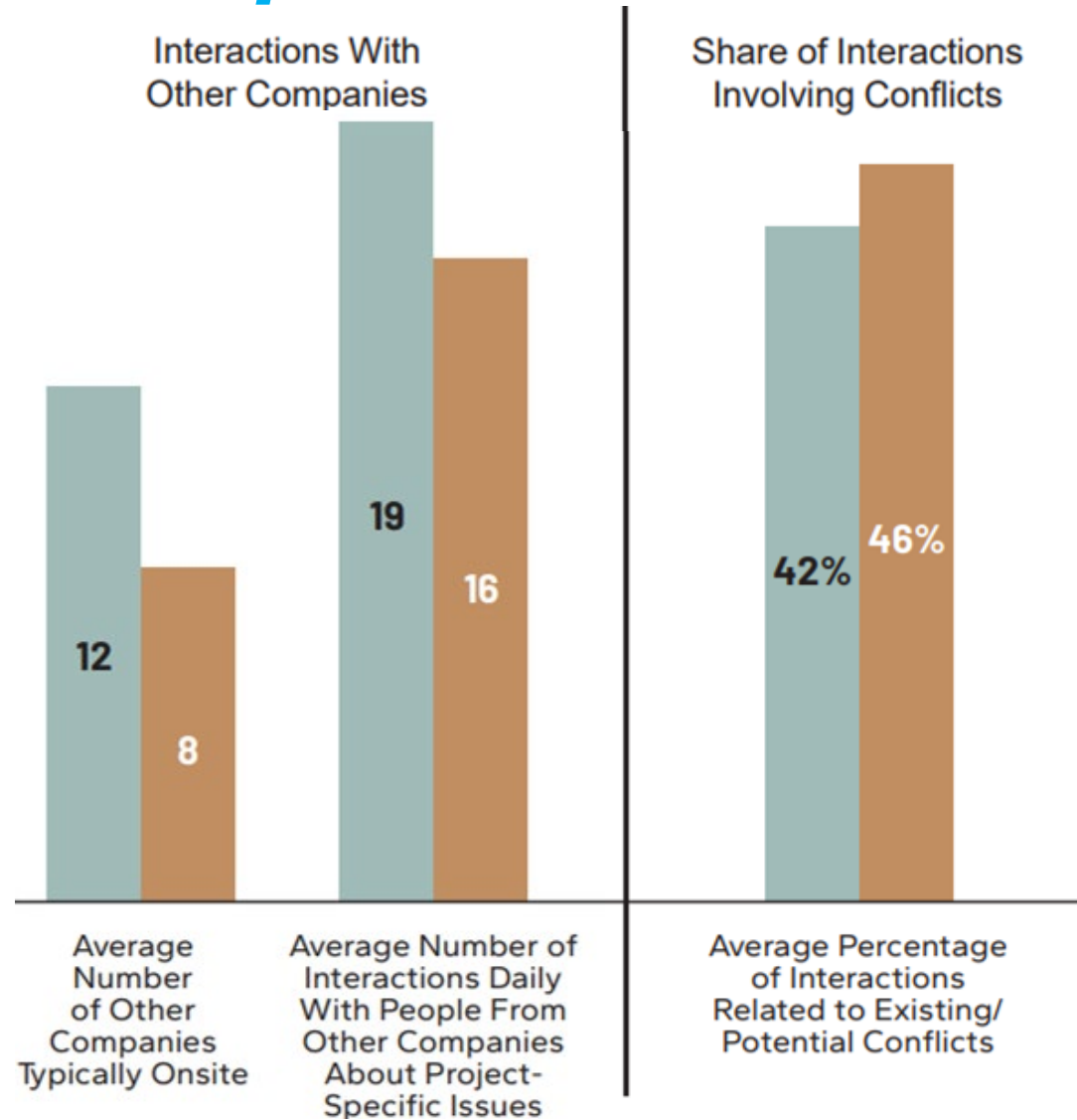
average profit erosion from
poor coordination

Daily Life in the Field: *Frequent Conflicts*

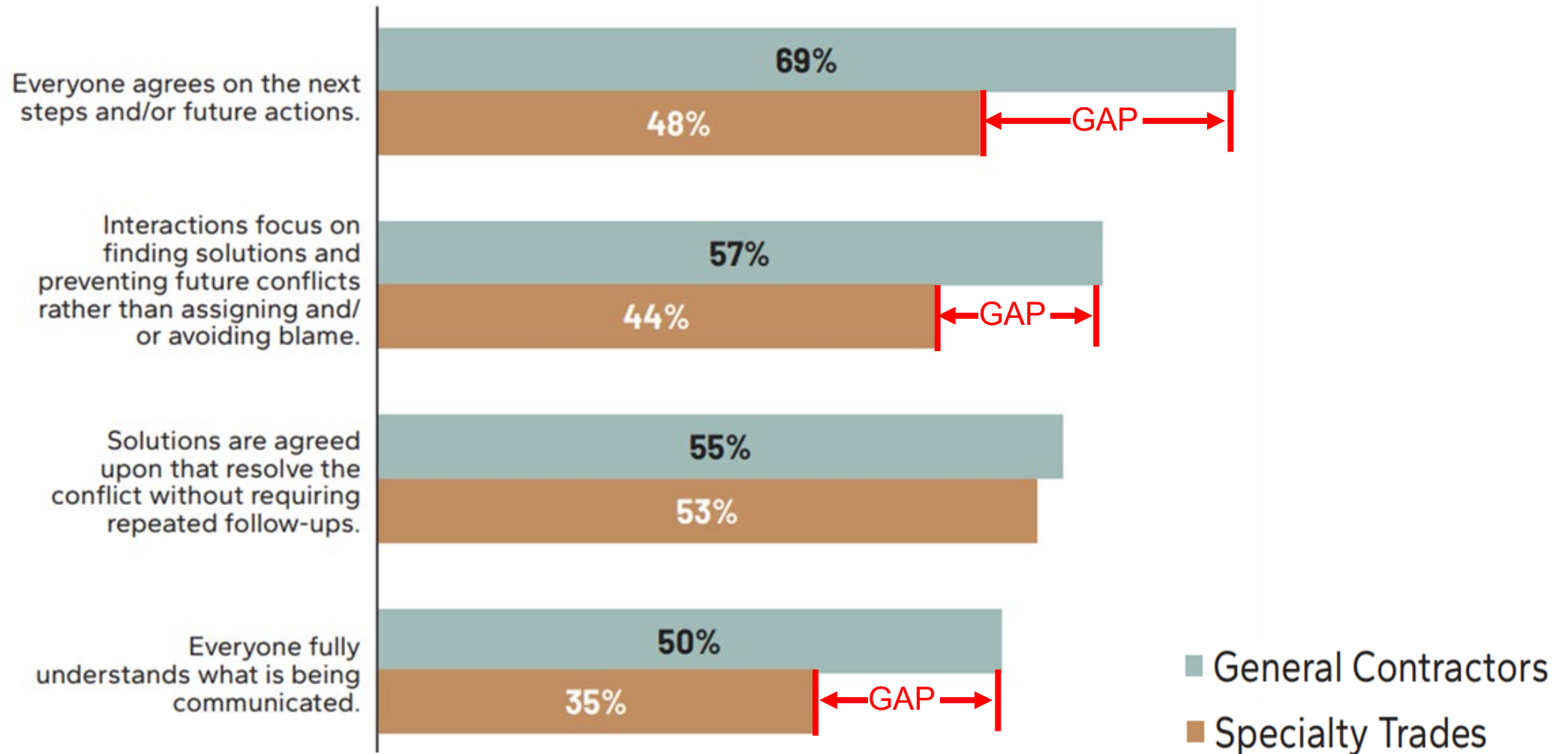
● Project-related interactions with other companies on the jobsite

- Frequency
- Conflict-related
- Resolution

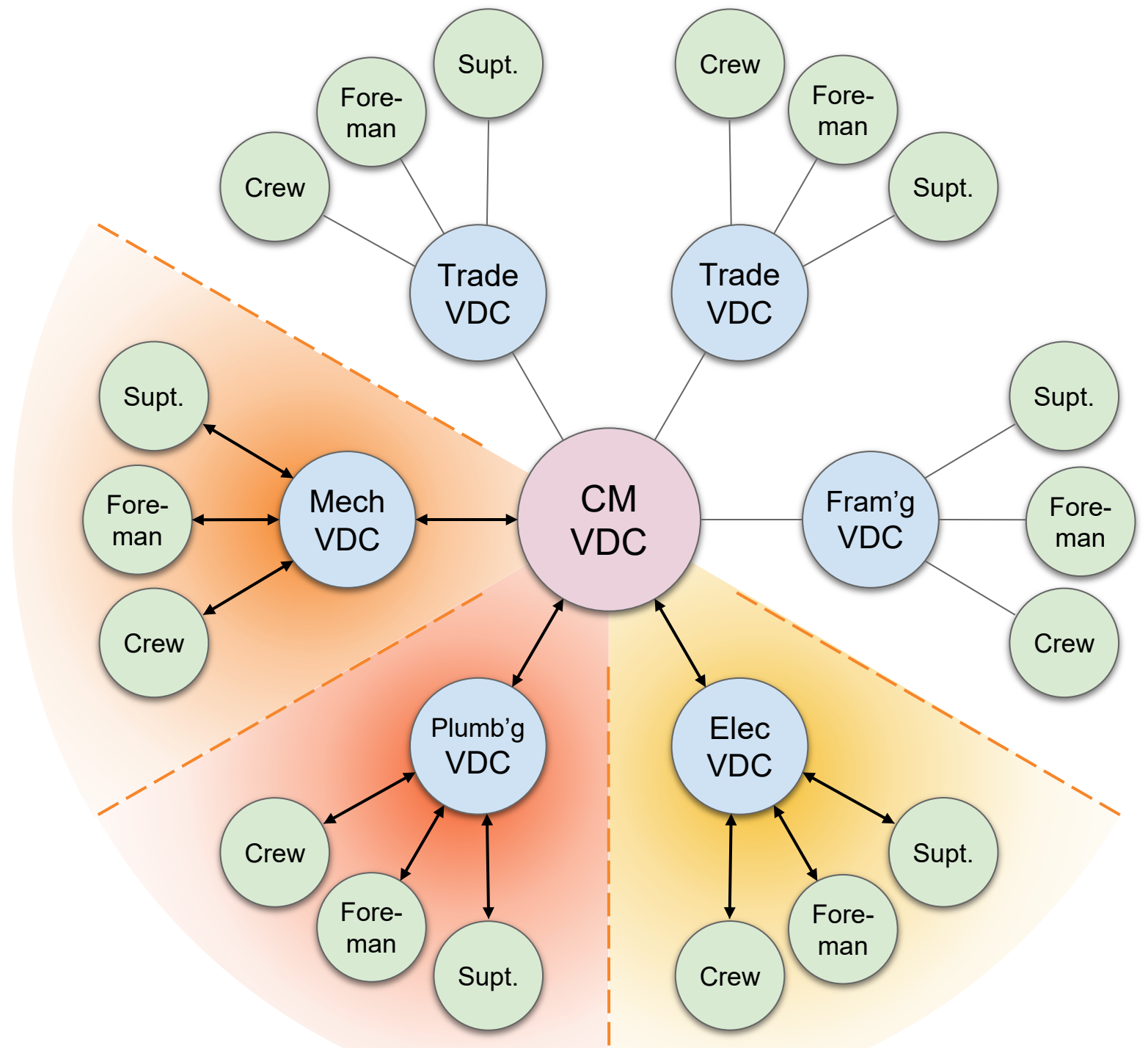
■ General Contractors
■ Specialty Trades



Attempts to Resolve Conflict In-Field

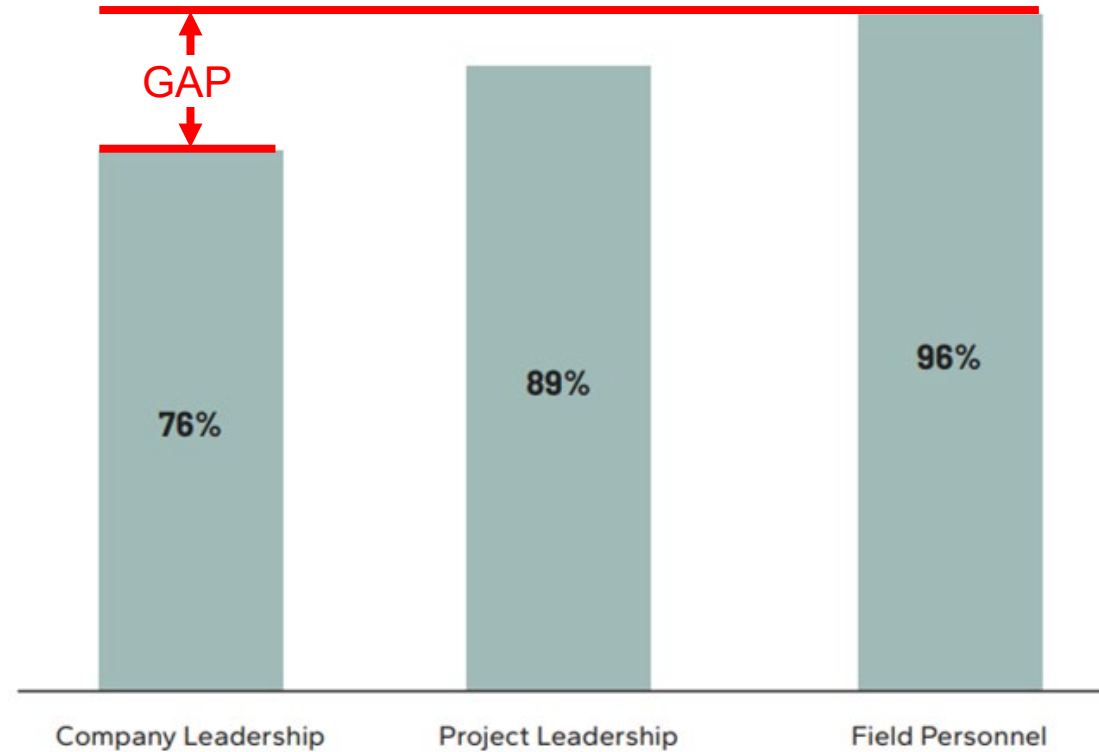


Communication Today Is Not Collaborative

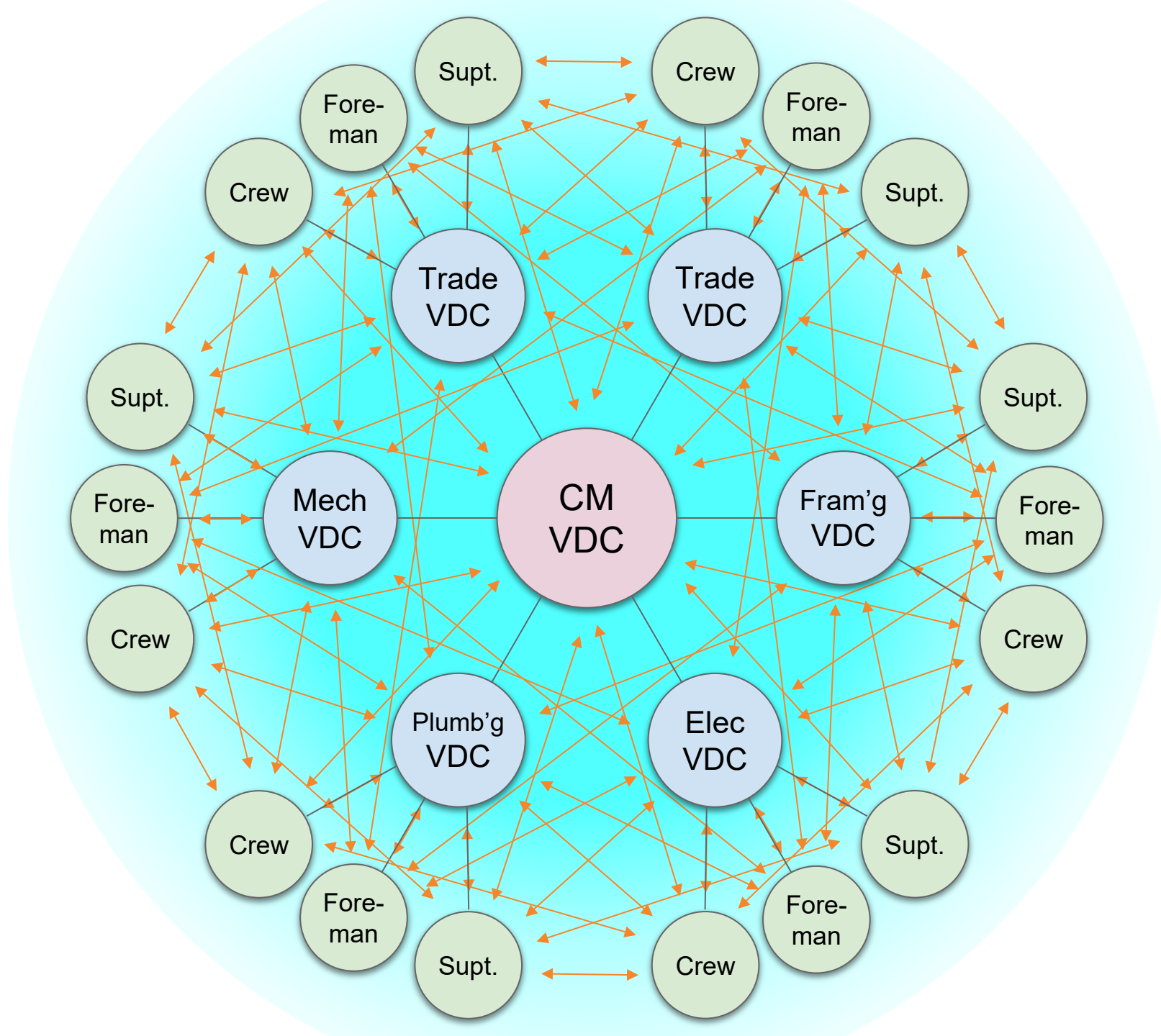


Everyone Agrees There's Room to Improve

Believes Their Company Needs to Do More to Foster Active Collaboration With Other Companies on the Jobsite



Productive Collaboration Isn't Strictly Hierarchical



Poor Coordination Causes Bad Projects

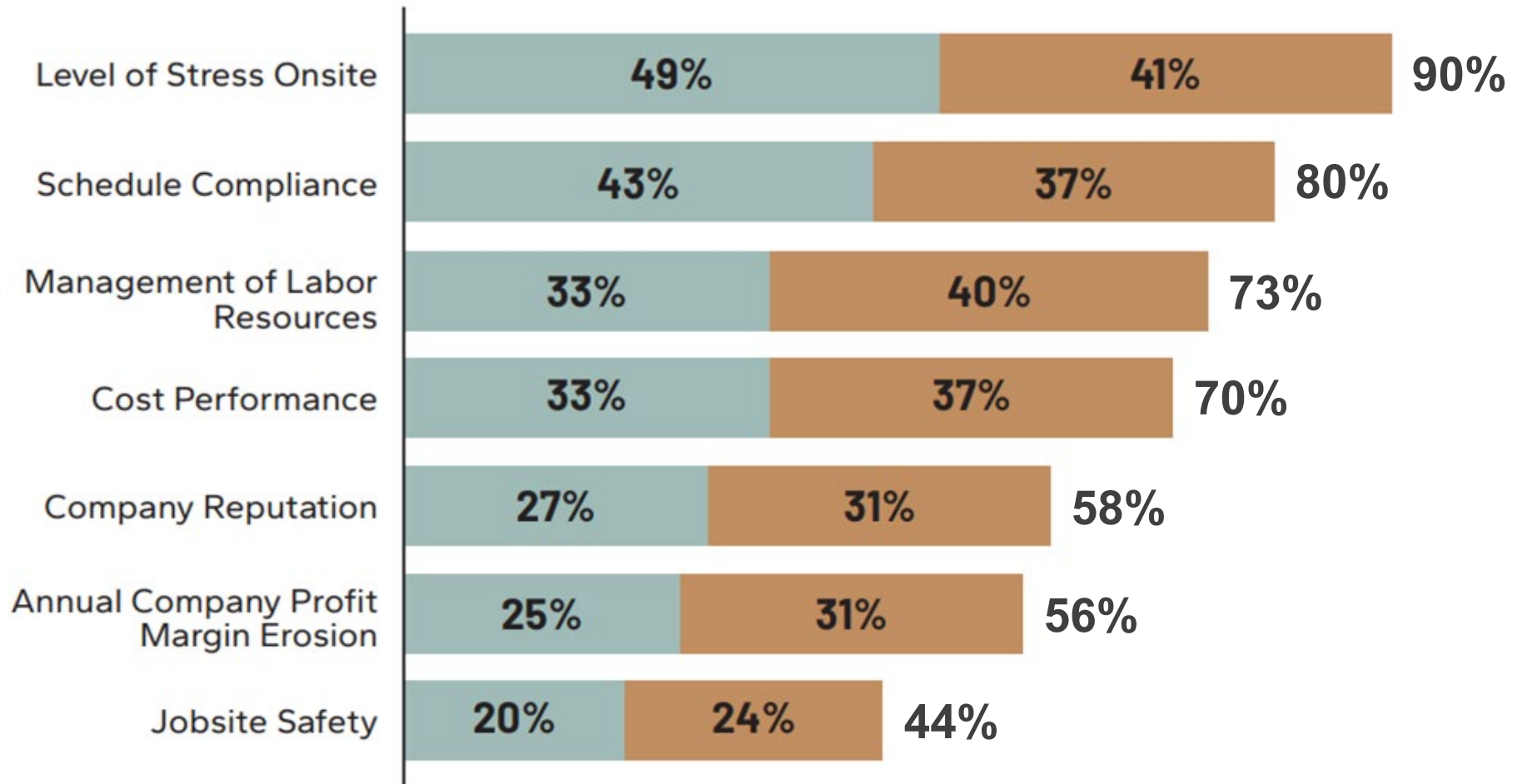
Coordination Issues at the Jobsite

- Impacts
- Causes
- Trades leading coordination

■ High/Very High

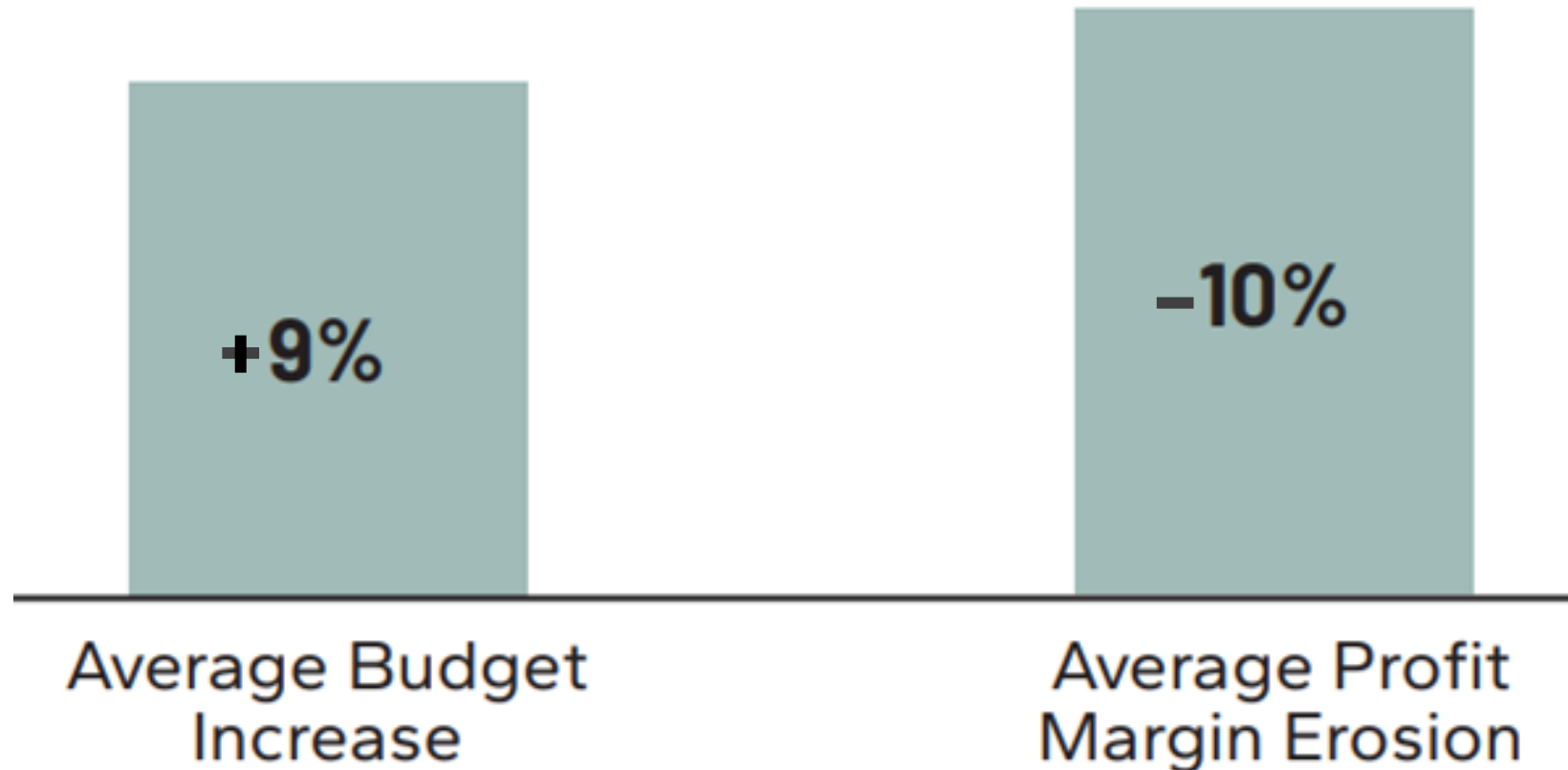
■ Moderate

Project Impacts of Coordination Issues

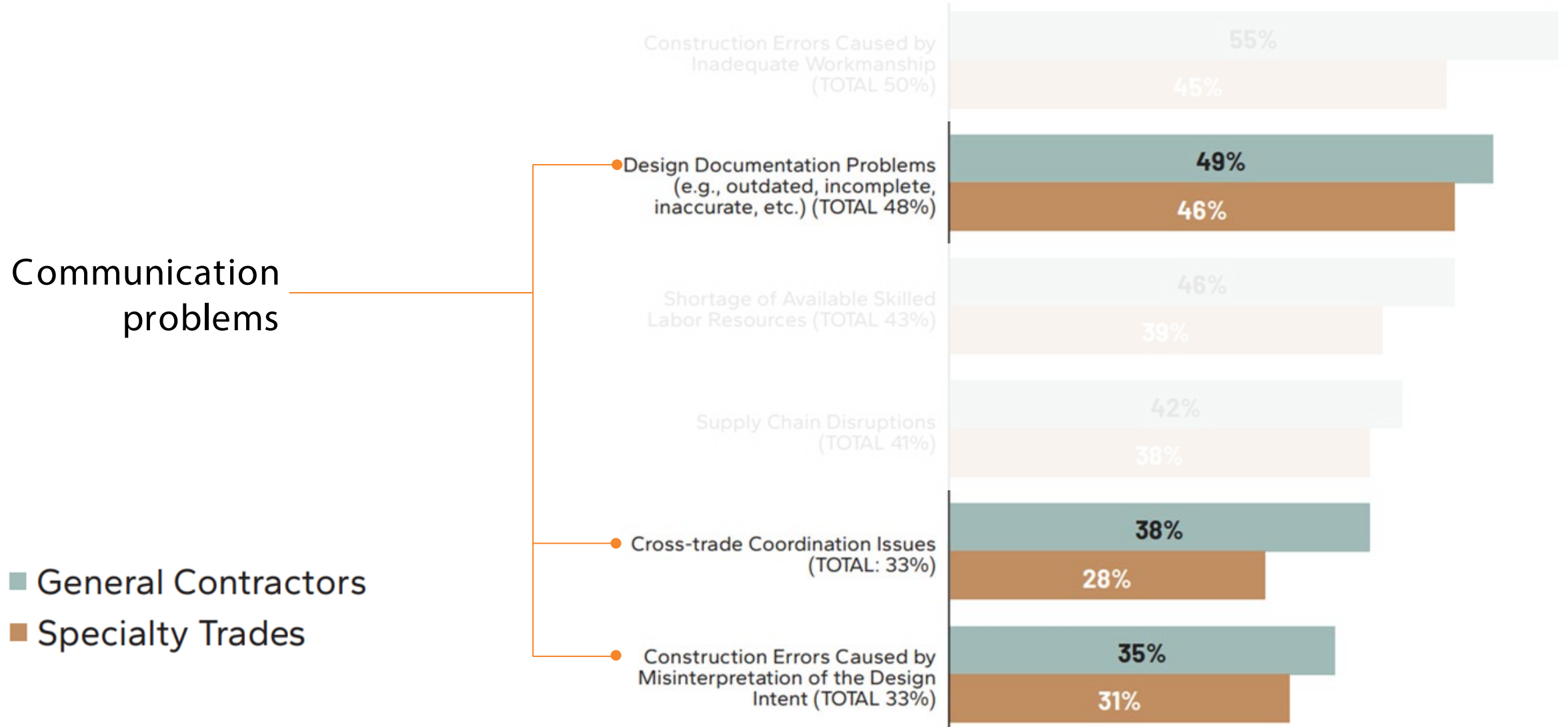


Bottom Line: This Hurts Profit Margins

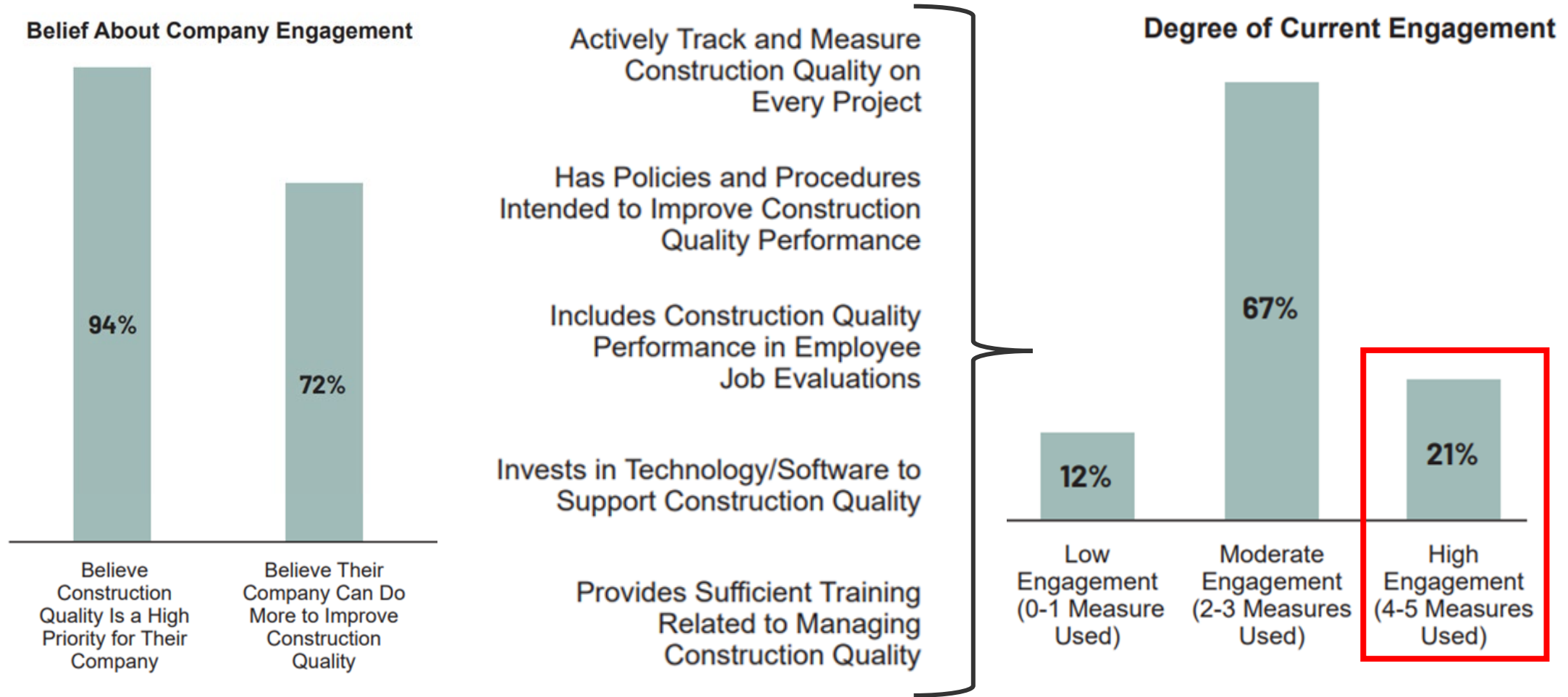
Average Impact on Cost Performance and Profit Margins



Factors Negatively Impacting Quality



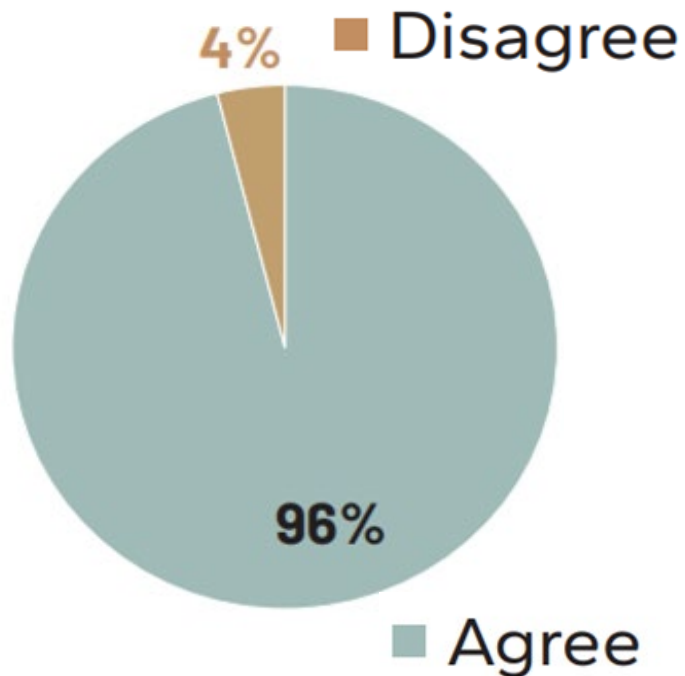
Quality is a Priority... but more can be done



Good News: *Everyone Values Collaboration*

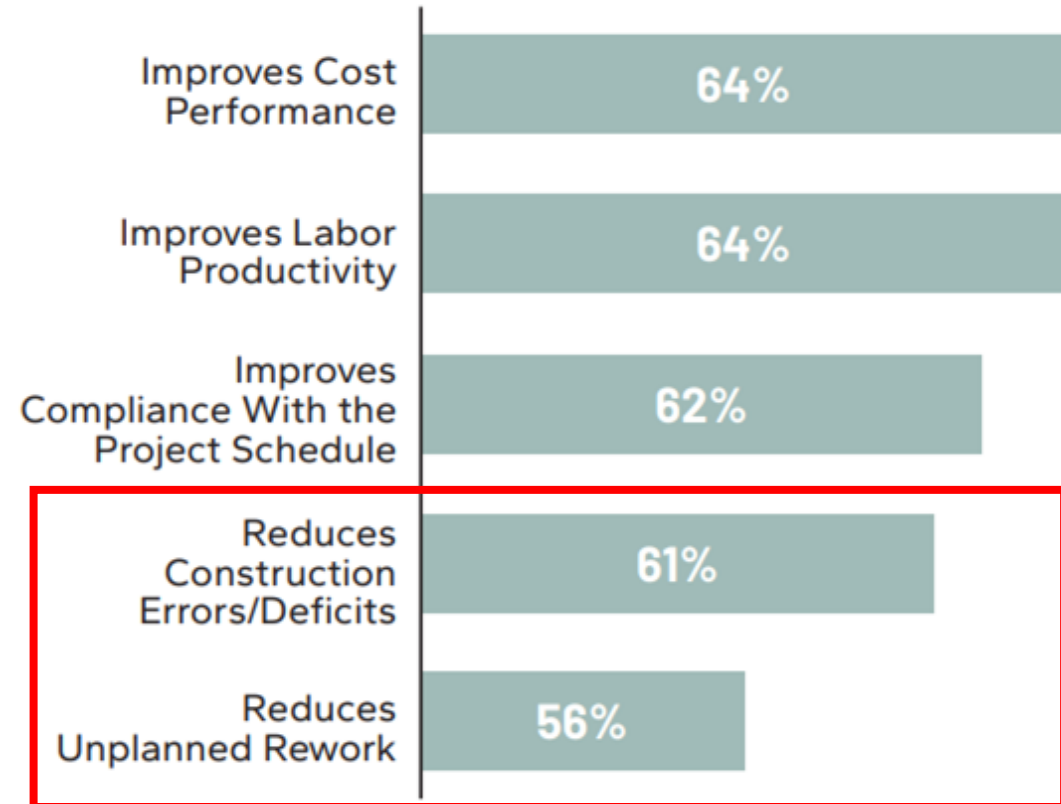
Active Collaboration With Other Companies Onsite Improves My Company's Project Performance

Dodge Construction Network, 2024



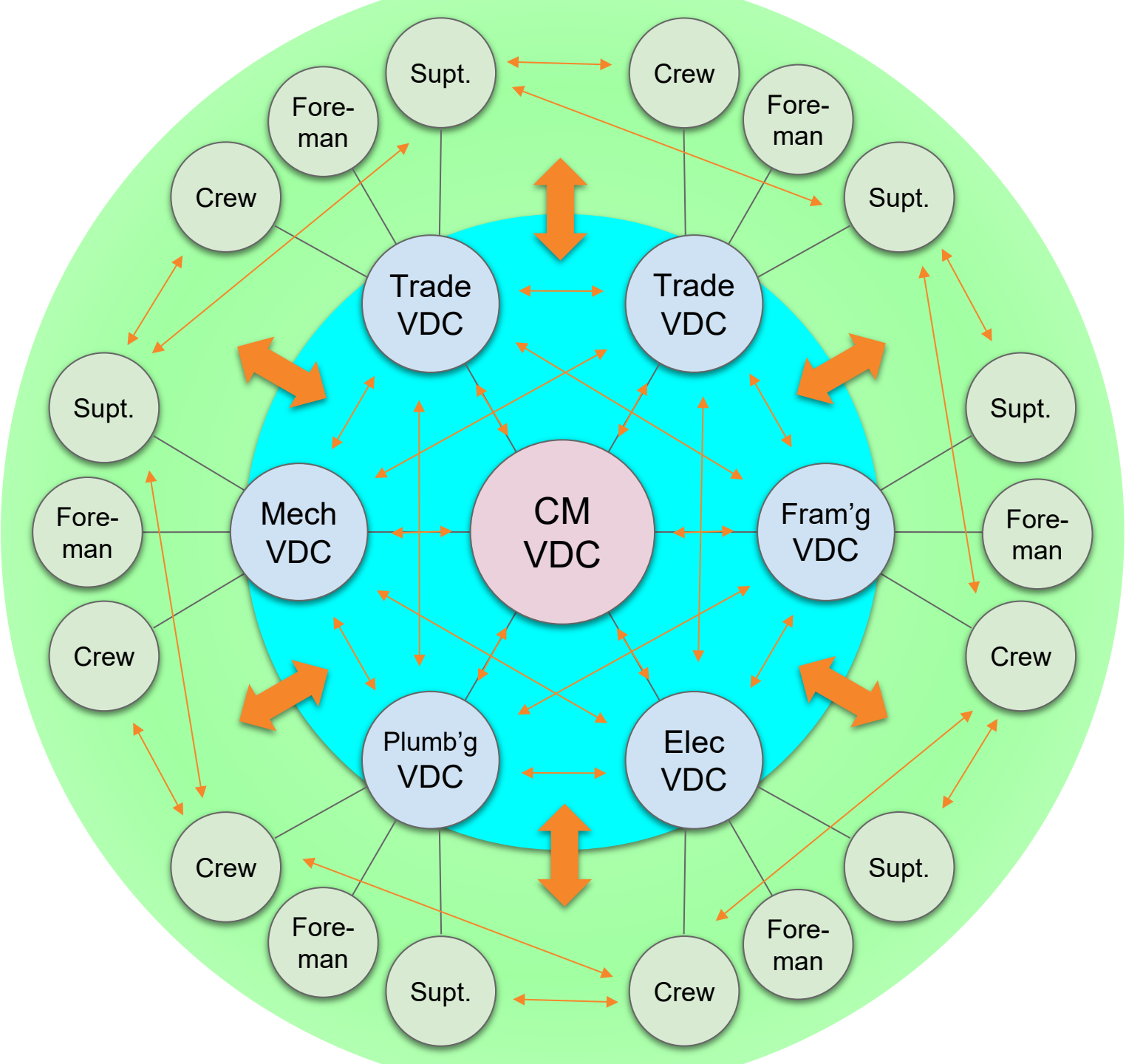
Frequently Experienced Benefits of Active Collaboration Onsite

(According to Those Who Agree That It Improves Project Performance)



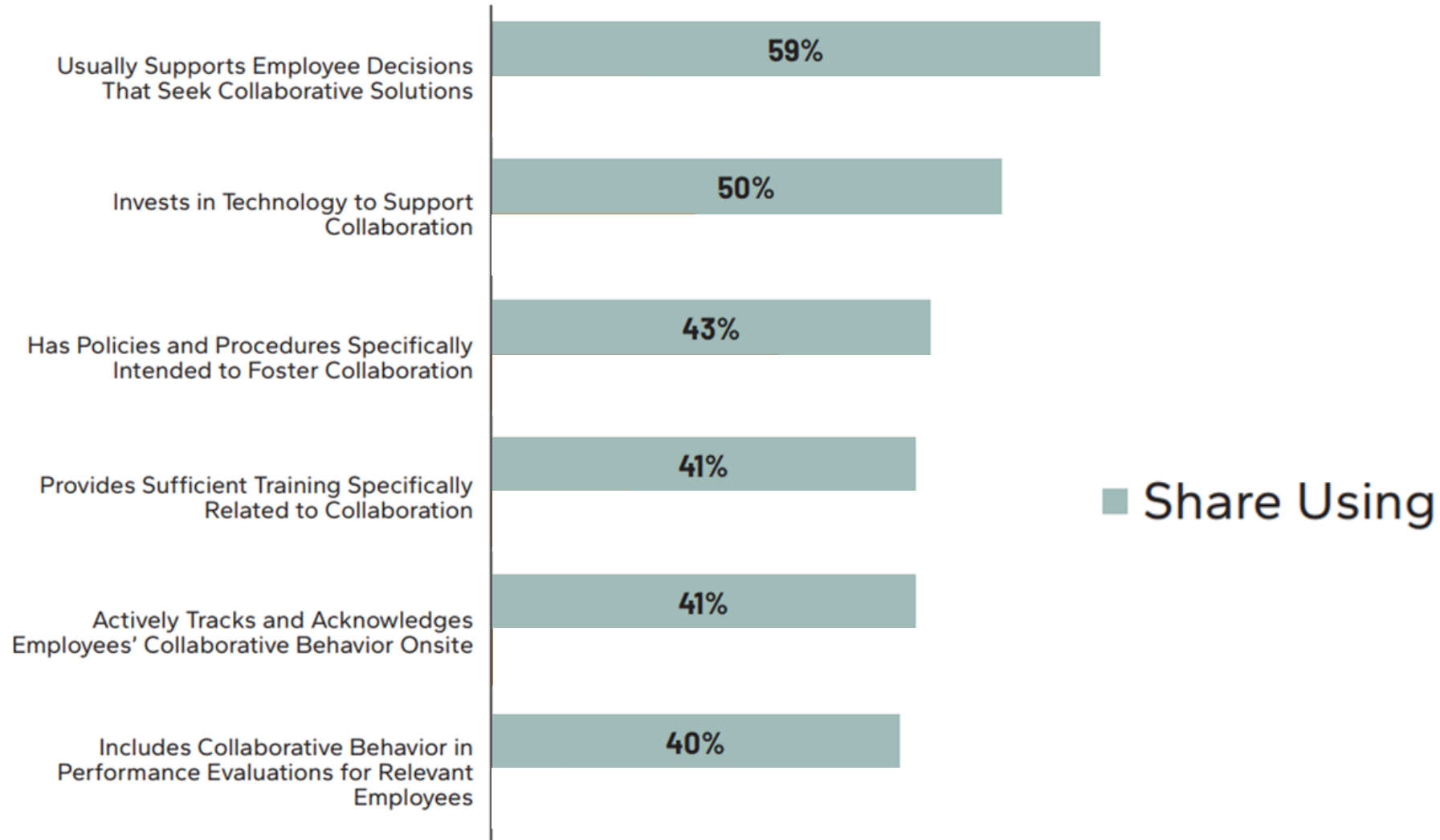
Impact Quality

**This Is Where
Jobsite
Collaboration
is Going**

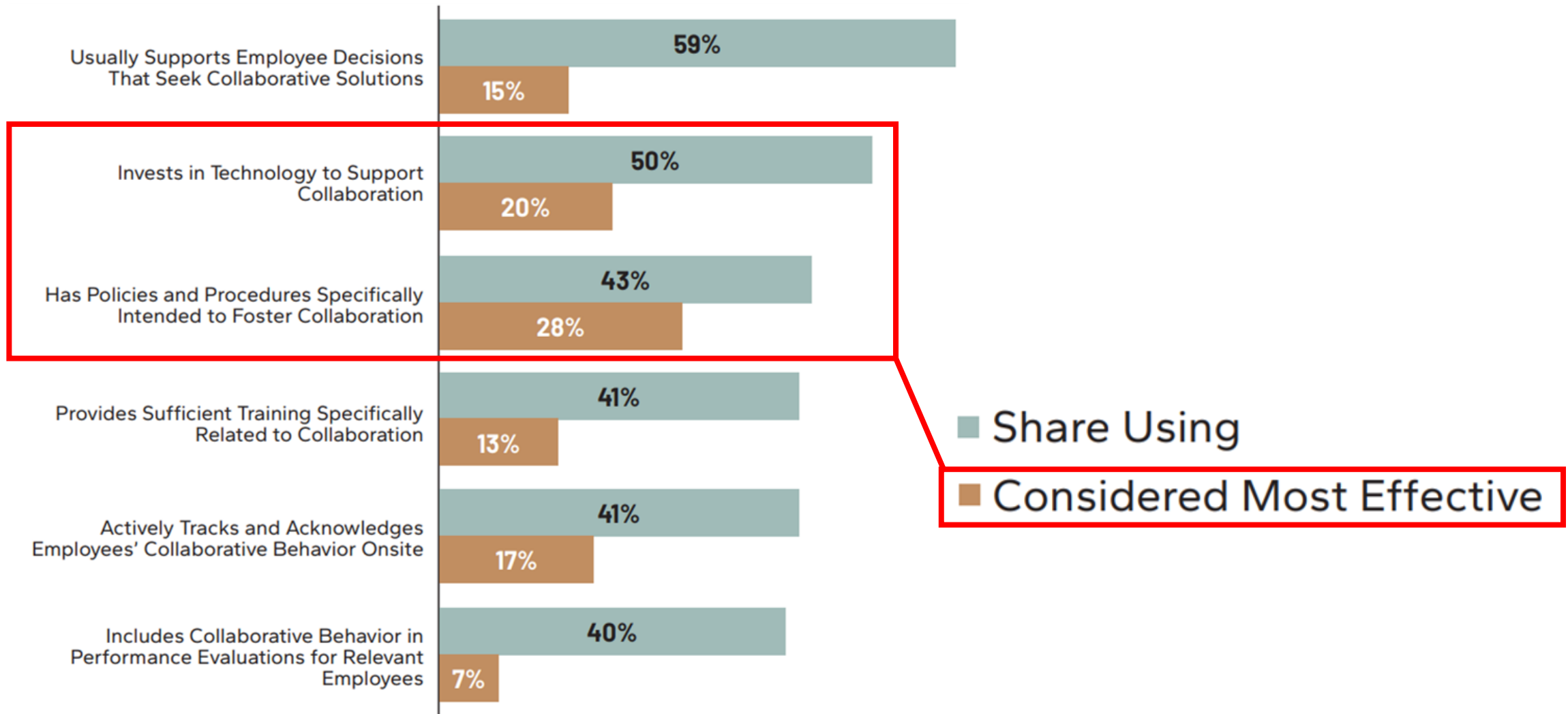


Source: Weitz Construction

Top Methods to Foster Active Jobsite Collaboration

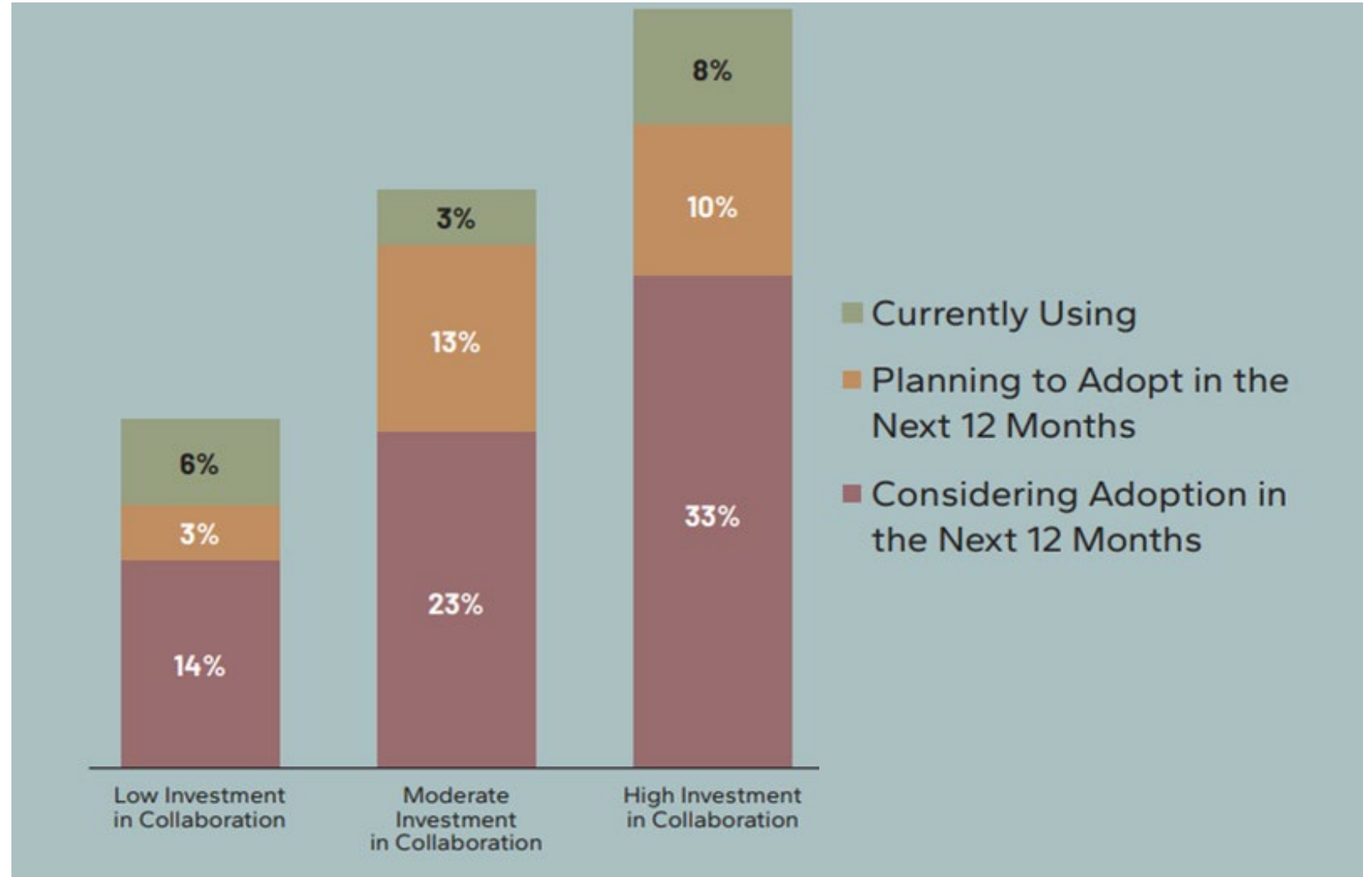


Top Methods to Foster Active Jobsite Collaboration



“High Collaborators”/ BIM-Driven Robotic Layout

More Contractors With a High Investment in Collaboration Use or Are Interested in BIM-Driven Robotic Layout



Digital Transformation of the Construction Industry

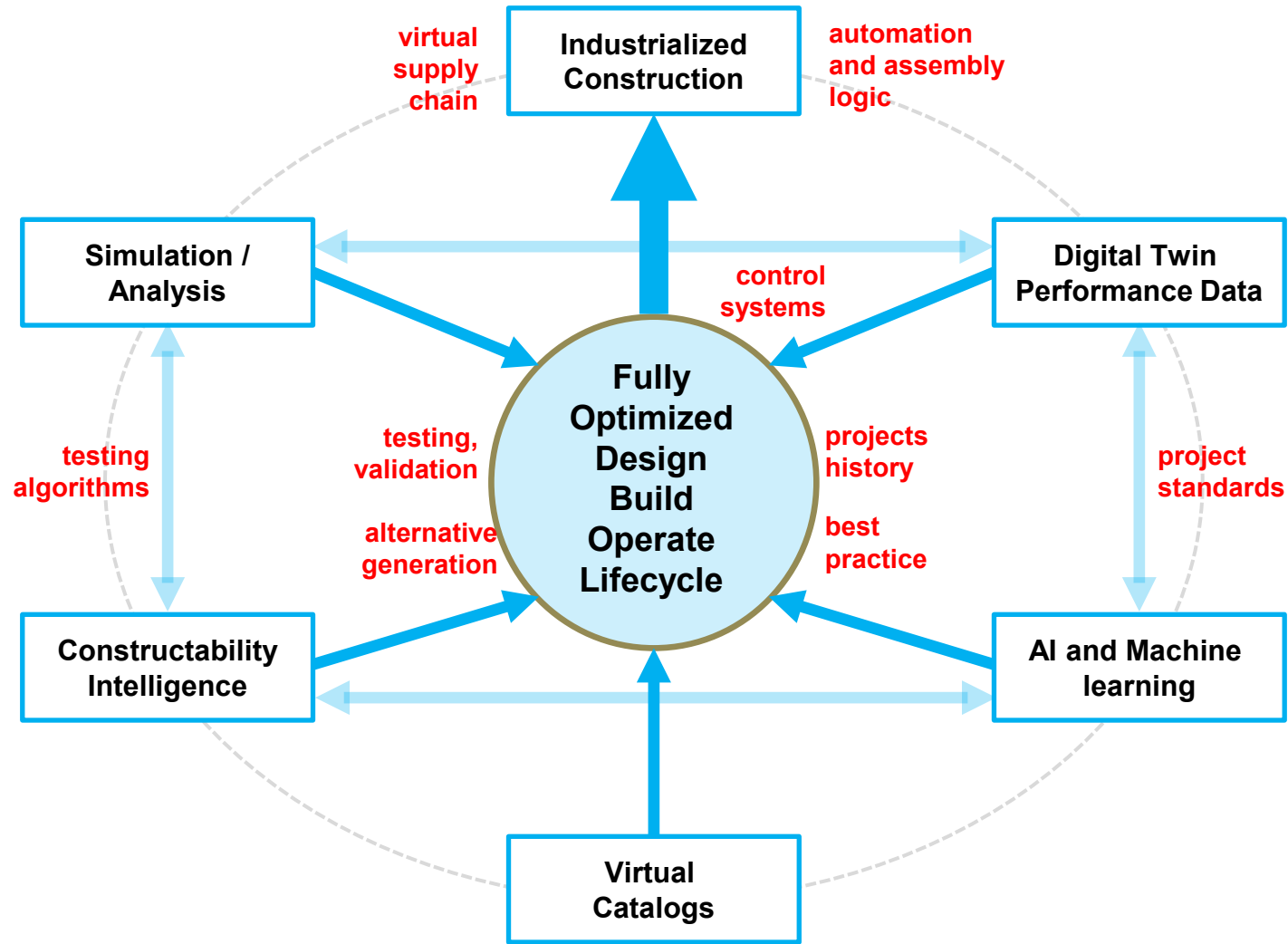
Digital Journey

Manual → Automated → Digital → Meta



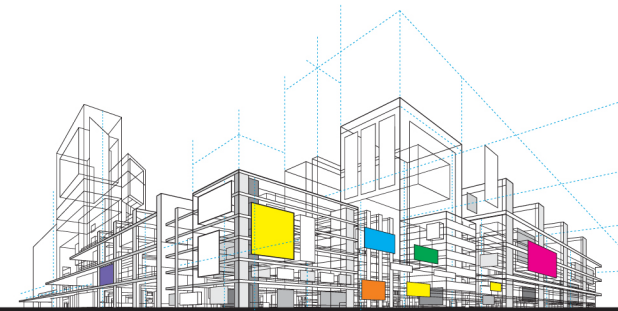
Virtual and Industrialized

Digital Transformation of the Construction Industry



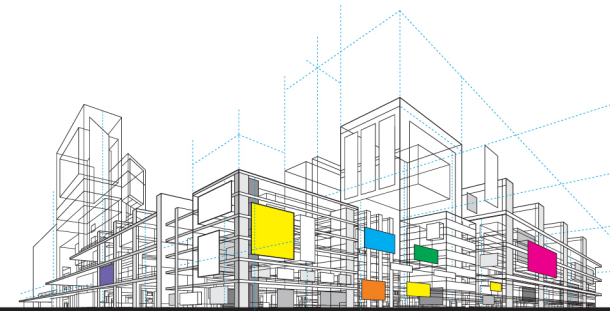
Agenda

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 - *Study Demographics*
 - *Use and Implementation of Software*
 - *Using Data*
 - *Company Engagement With Technology*



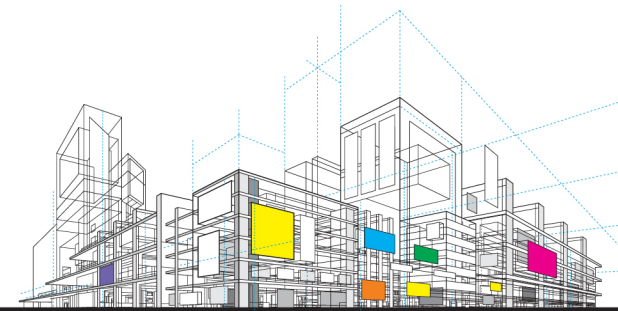
Study Demographics

- 72 contractors participated in the survey.
- Survey was conducted Nov 11 – Dec 27 2024
- MCAA, NECA and SMACNA sent invitations to participate in the survey to their members (no other means was used to recruit contractors to participate)
- Participants could choose any of the following types of services that applied to their company:
 - Sheetmetal/Ductwork: 79%
 - HVAC: 63%
 - Mechanical/Piping: 51%
 - Plumbing: 46%
 - Refrigeration: 43%
 - Electrical: 40%
- Job Roles
 - C-Level/Owner/SVP/VP/ Director: 71%
 - Other Roles (Manager/Site/IT): 29%
- Annual Construction Volume
 - SMALL: Less Than \$50M: 42%
 - MIDSIZE/LARGE: \$50M or More: 58%



Agenda

- Study Demographics
- Use and Implementation of Software
 - **Overall**
 - Functional Implementation
 - Deeper Dive Into Specific Functions
- Using Data
- Company Engagement With Tech

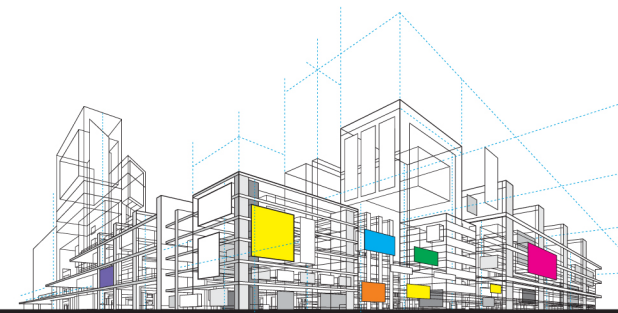
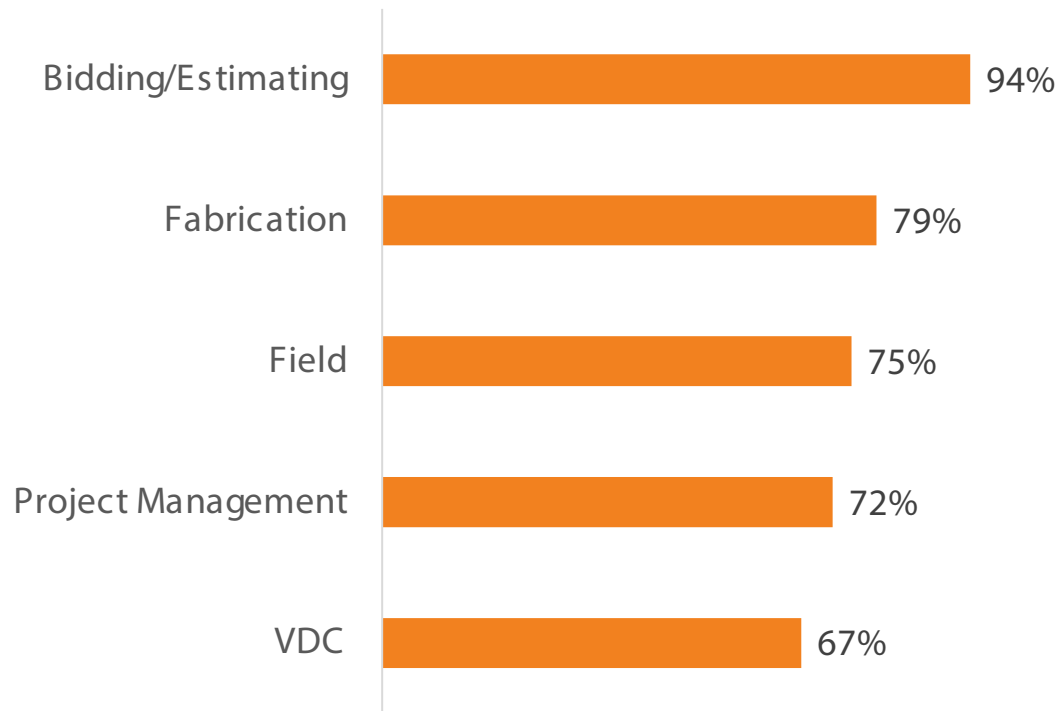


Use of Software

Using Dedicated Software for 5 Functions

Most MEP contractors use dedicated software for each function

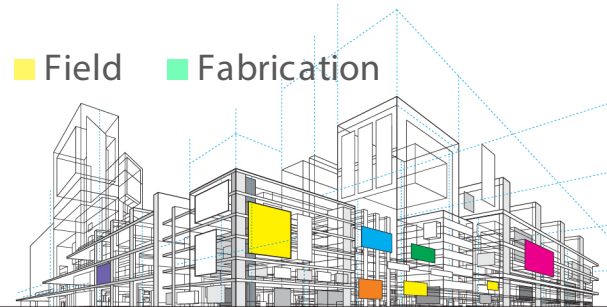
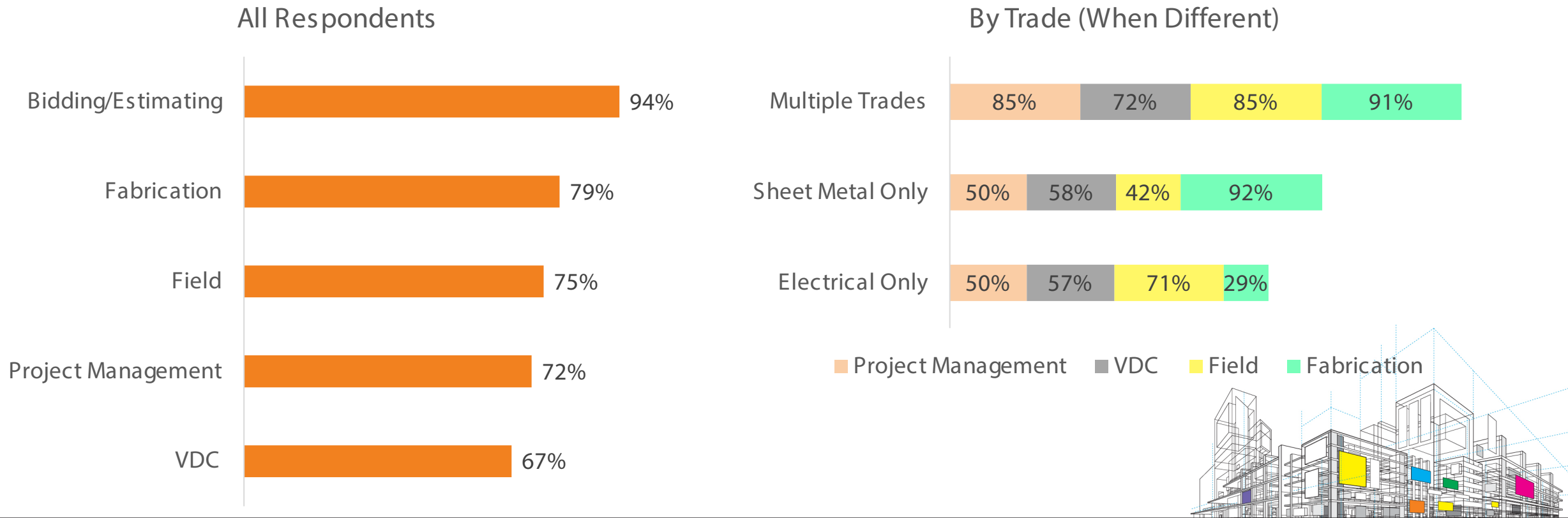
All Respondents



Use of Software

Using Dedicated Software for 5 Functions

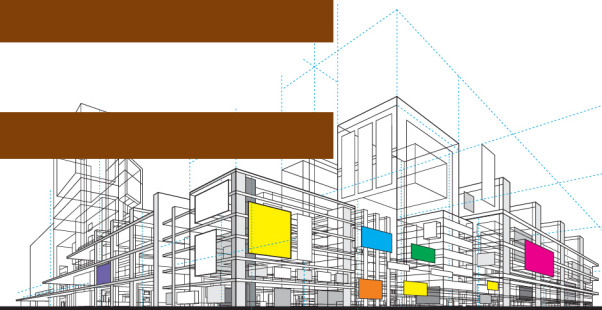
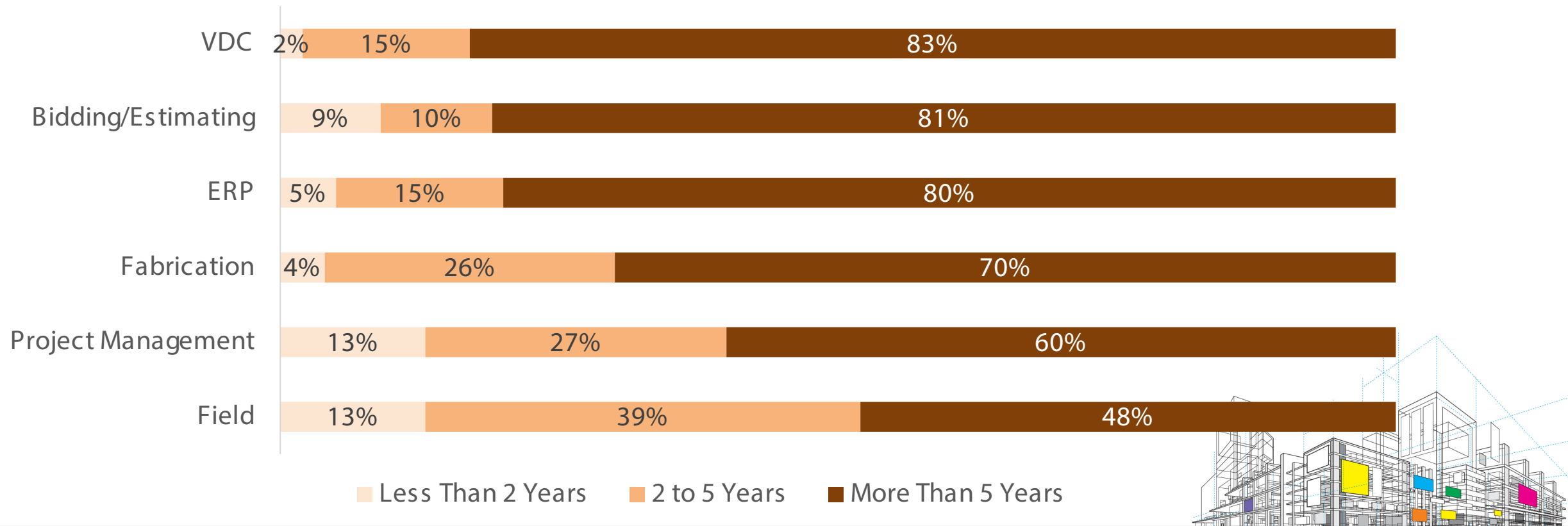
Most MEP contractors use dedicated software for each function



Use of Software

Duration of Dedicated Software Use

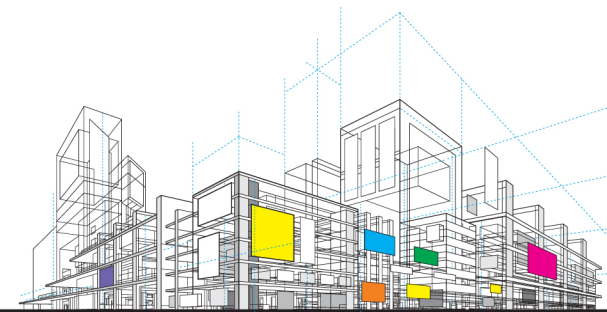
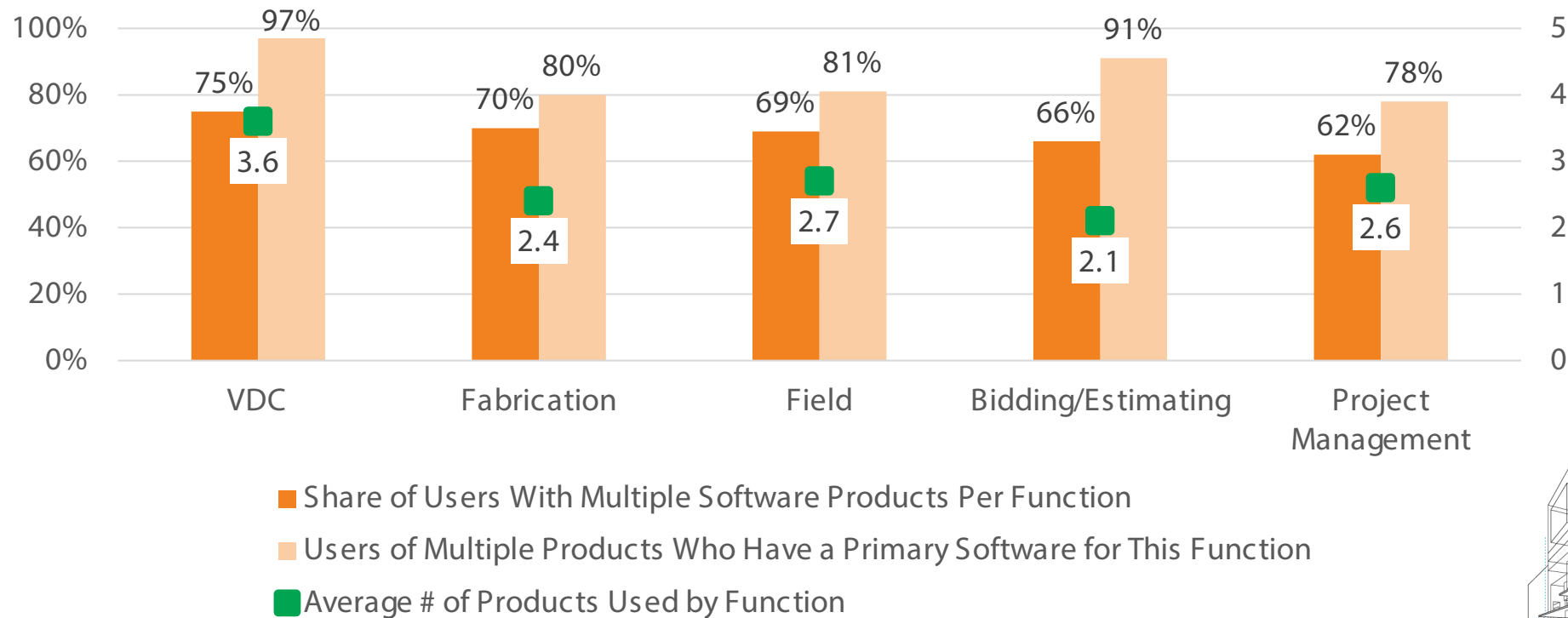
Most MEP contractors have used this software for more than 5 years



Use of Software

Use of Multiple Software Products

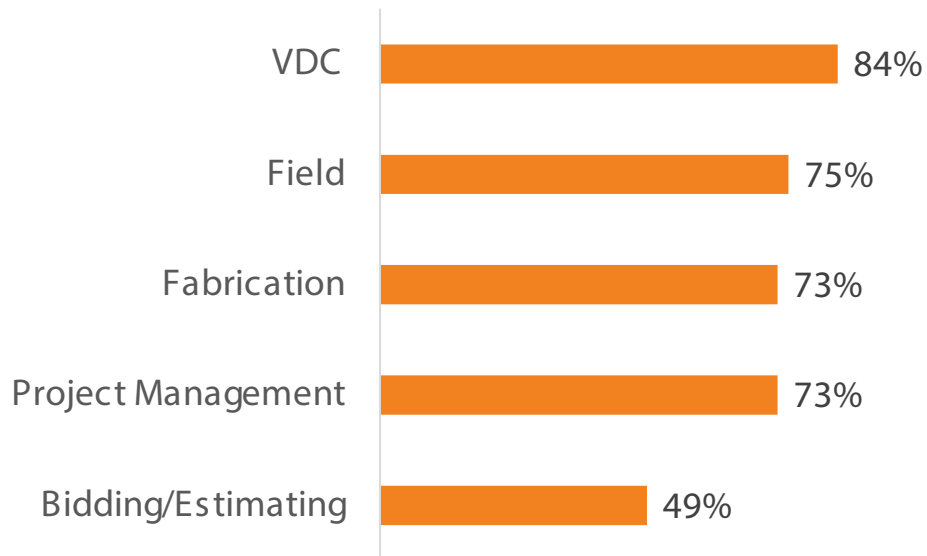
Most MEP contractors use multiple solutions for each function but also typically have one primary software for each



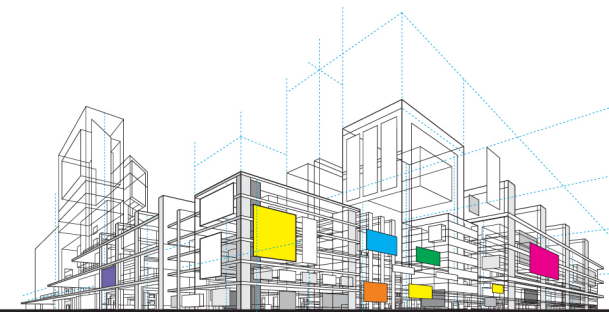
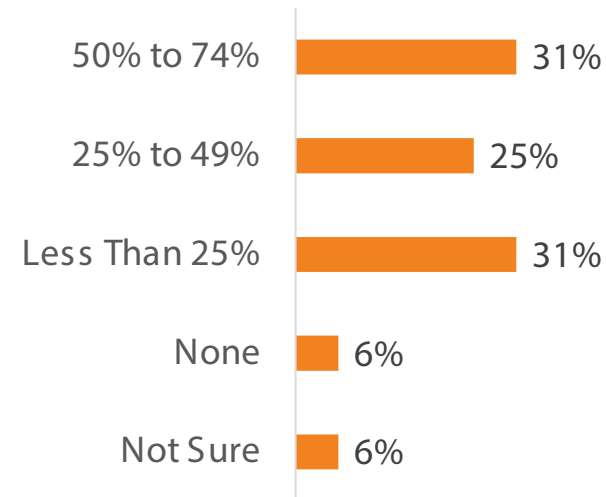
Use of Software Integrations With Other Technologies

Primary Software Tools Typically Can Be Integrated With Other Apps

Primary Software Can Be Integrated With Other Applications



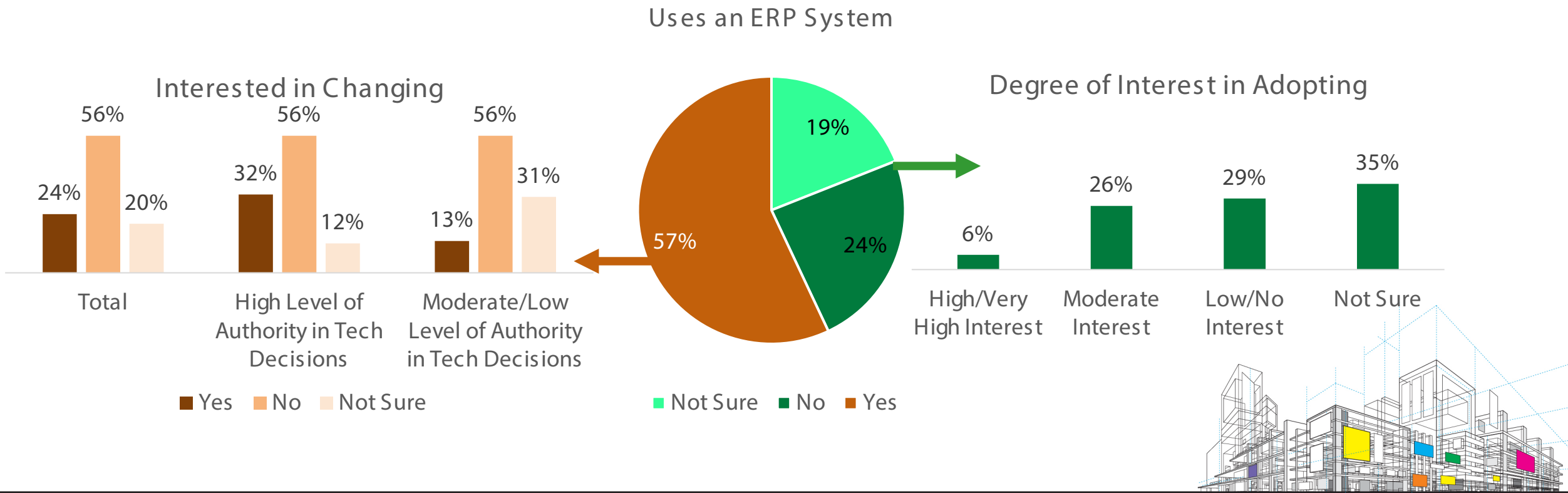
Share of Software That Can Be Integrated With Other Solutions Reported by Those With No Primary Software



Use of Software

Use an ERP System

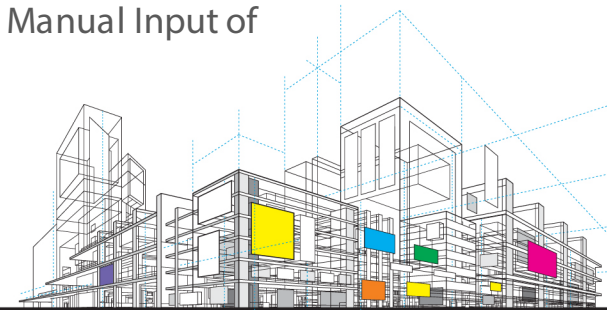
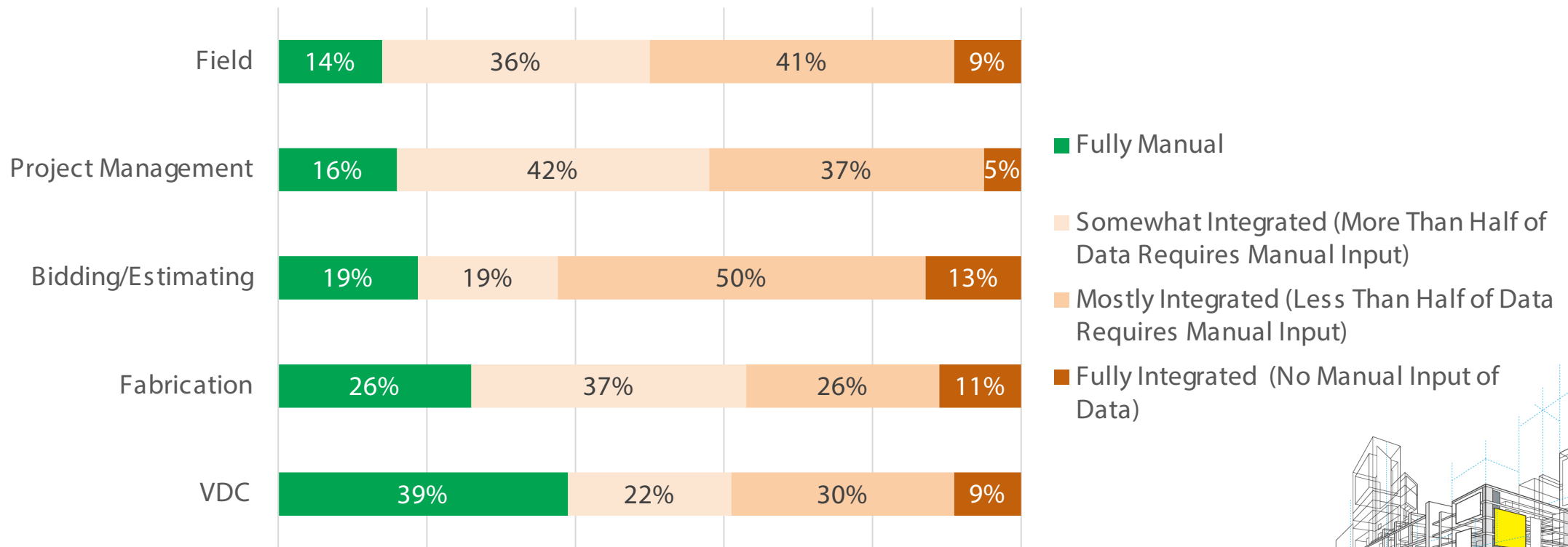
Nearly half do not say that they use an ERP



Use of Software

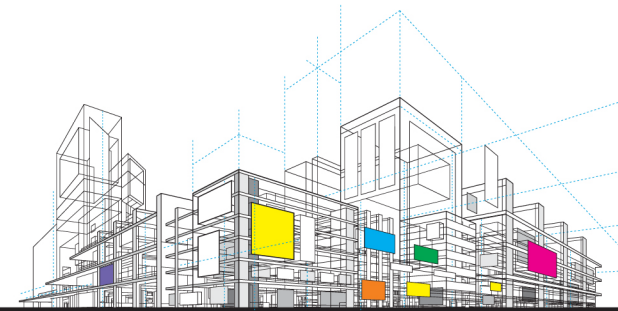
Integrations of Dedicated Software With ERP

Very Few Functions Are Fully Integrated With the ERP Systems



Agenda

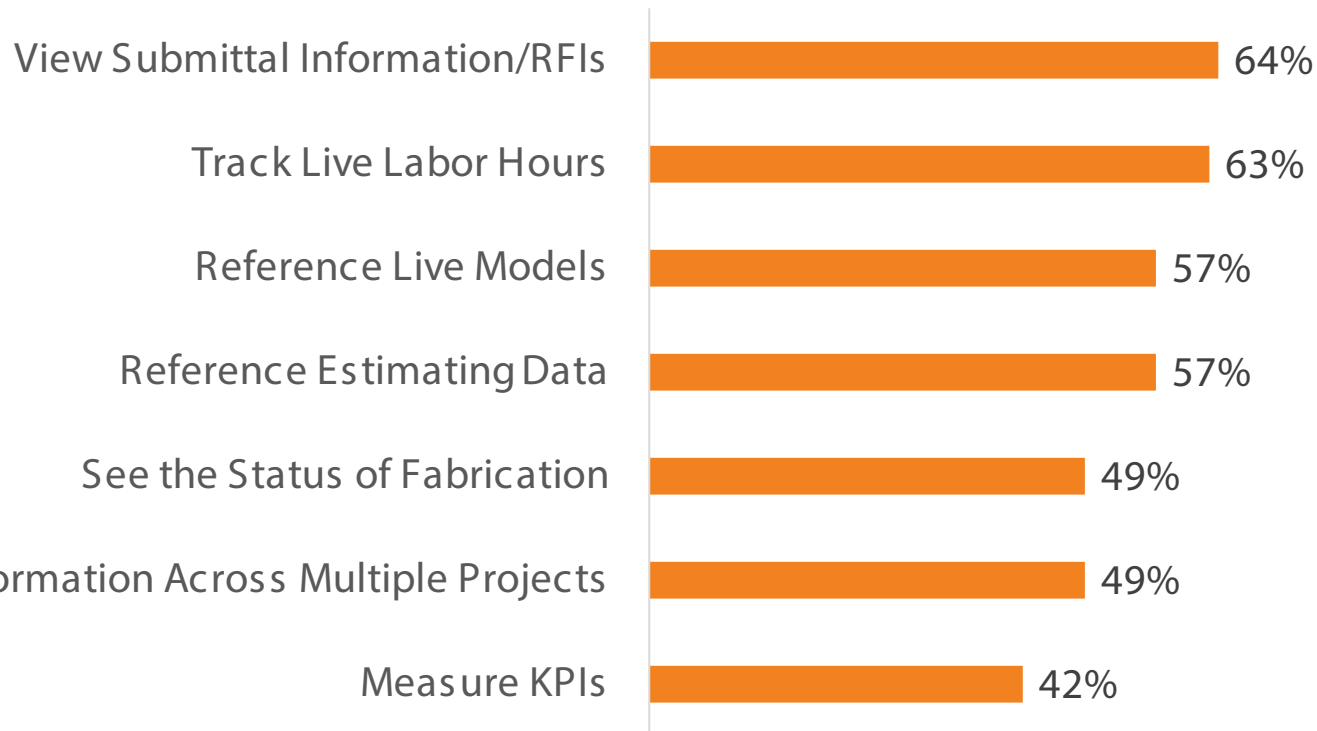
- Study Demographics
- Use and Implementation of Software
 - Overall
 - **Functional Implementation**
 - Deeper Dive Into Specific Functions
- Using Data
- Company Engagement With Tech



Use of Software: Functional Implementation

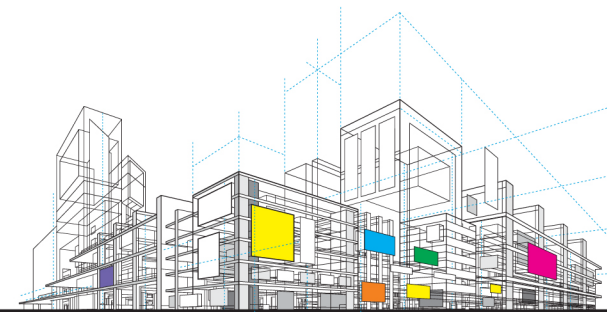
Functional Implementation of Technology

MEP Contractors Vary in the Which of the 7 Activities They Do Using Technology



Two Functional Implementation Groups

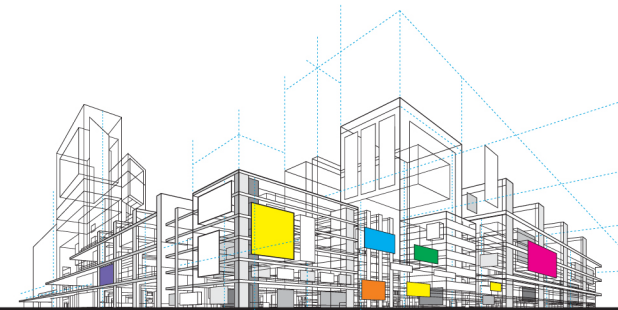
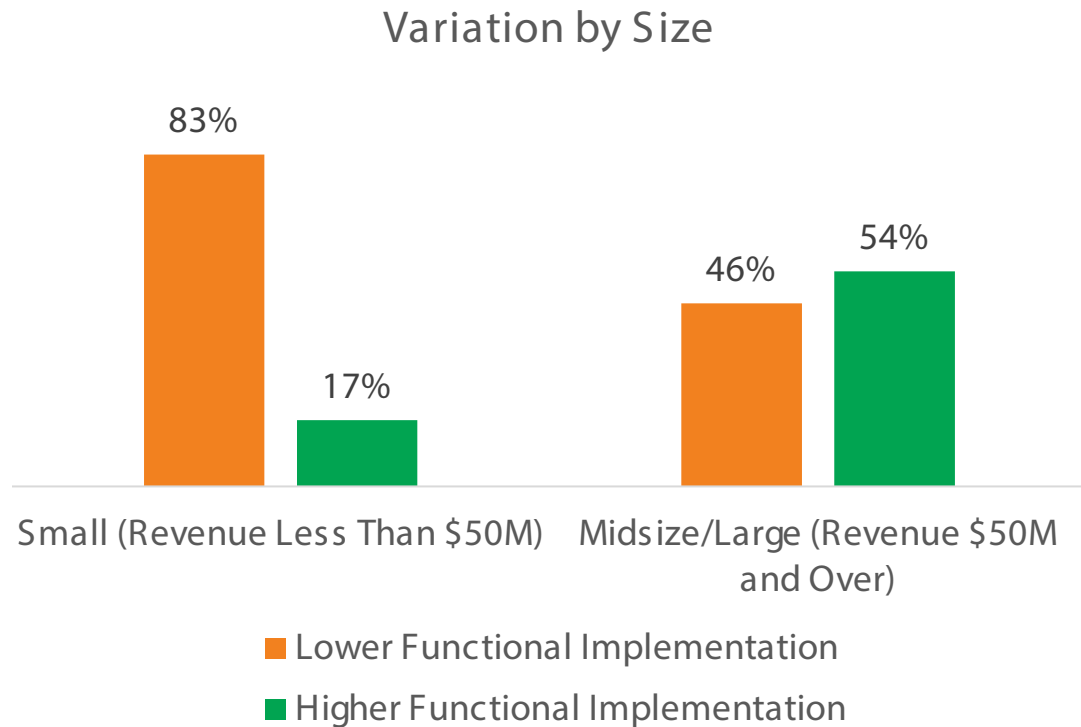
- Lower: 4 or fewer
- Higher: 5 or more



Use of Software: Functional Implementation

Functional Implementation of Technology

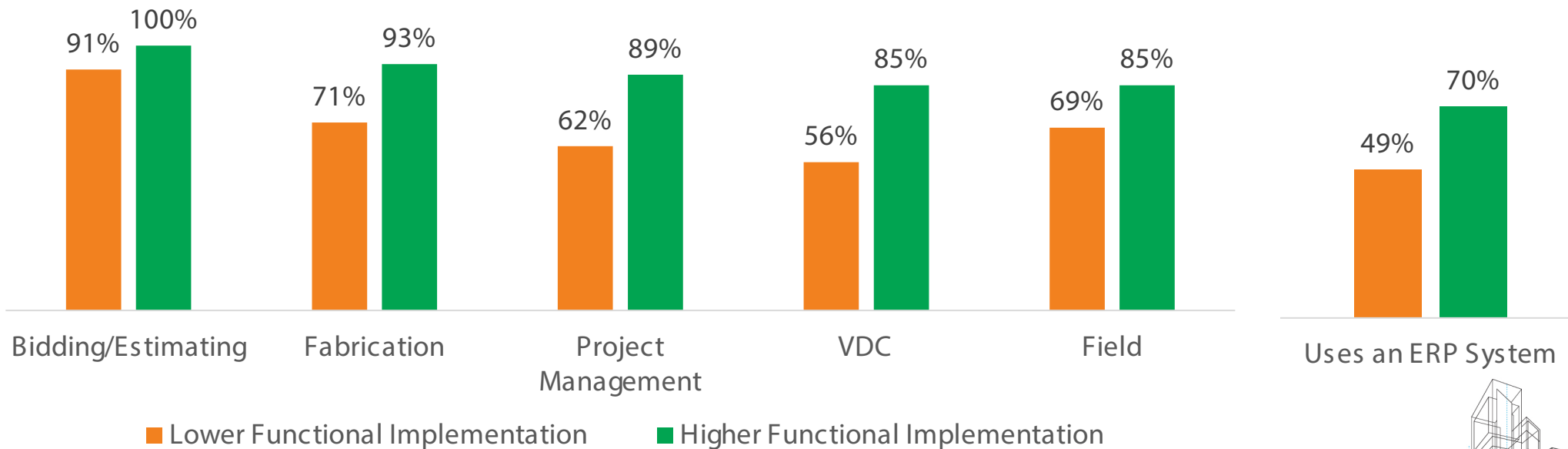
Some Correlation Exists Between Size and Functional Implementation



Use of Software: Functional Implementation

Functional Implementation & Software Use

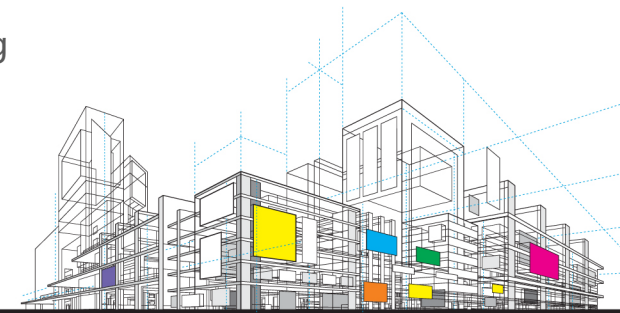
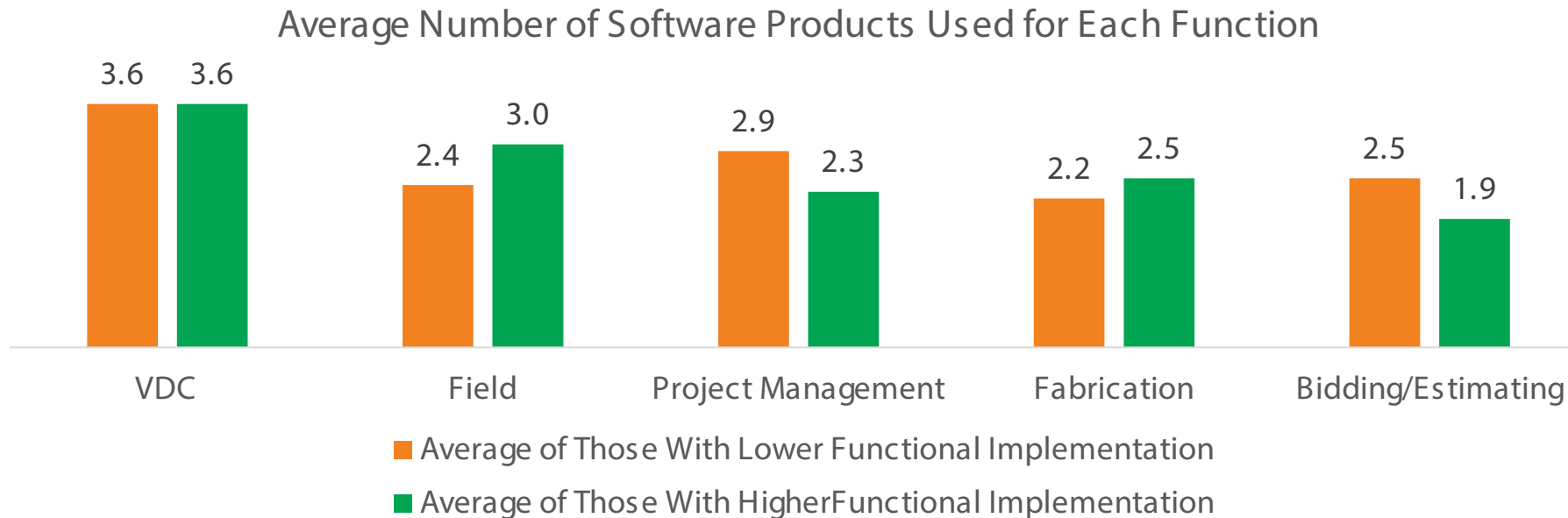
Not surprisingly, those getting more functions done via tech are more frequently using dedicated software for each activity and have an ERP system



Use of Software: Functional Implementation

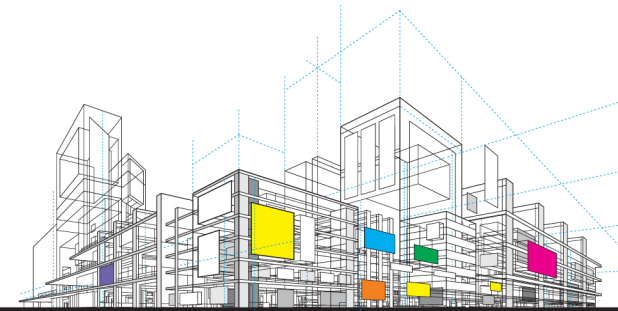
Functional Implementation and Number of Software Products Used

Those with higher implementation use fewer software products for project management and bidding/estimating, but more in the field.



Agenda

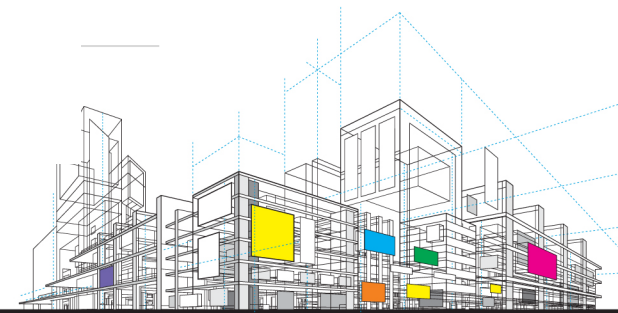
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Use of Software: Bidding/Estimating

Use MCAA, NECA, SMACNA Labor Hours

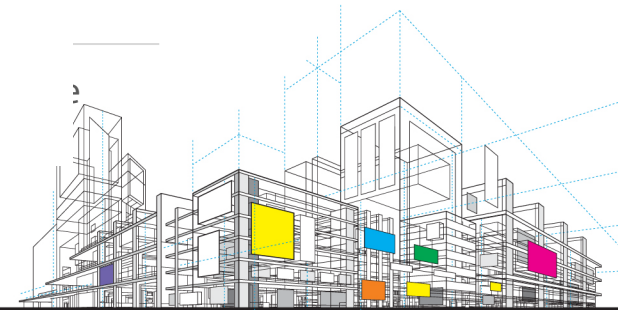
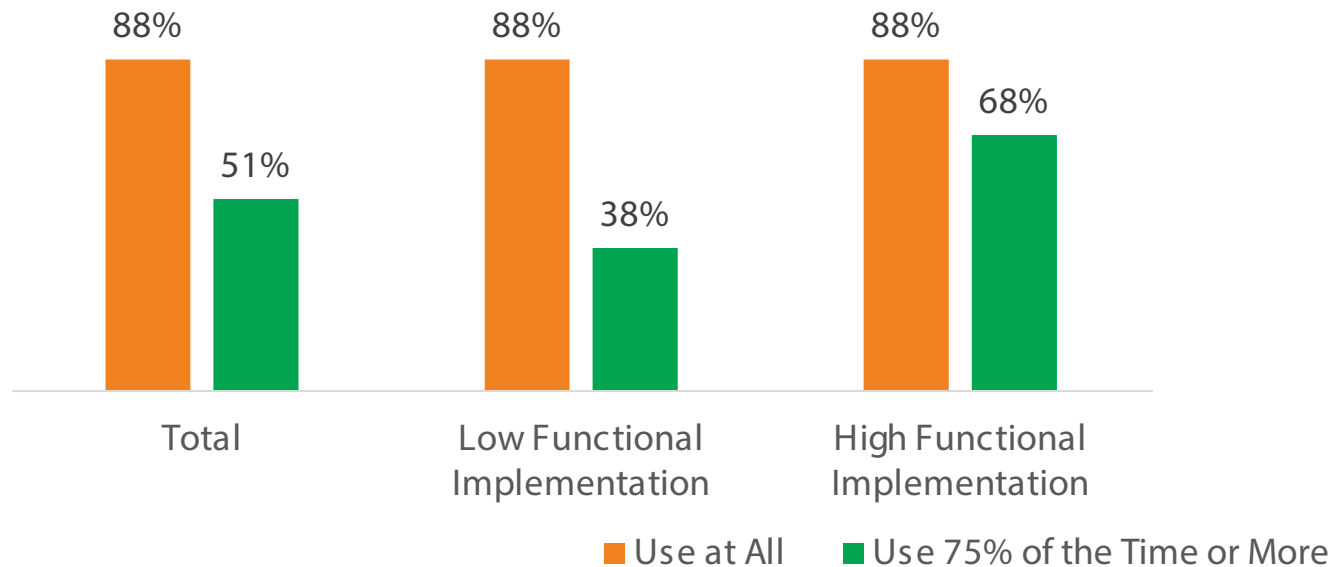
Most use their organization's labor hours when using estimating software, but only half do so the majority of the time.



Use of Software: Bidding/Estimating

Use MCAA, NECA, SMACNA Labor Hours

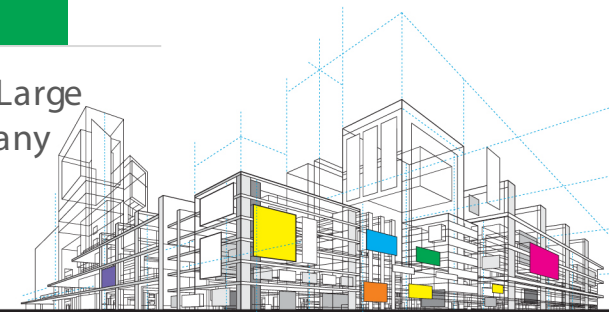
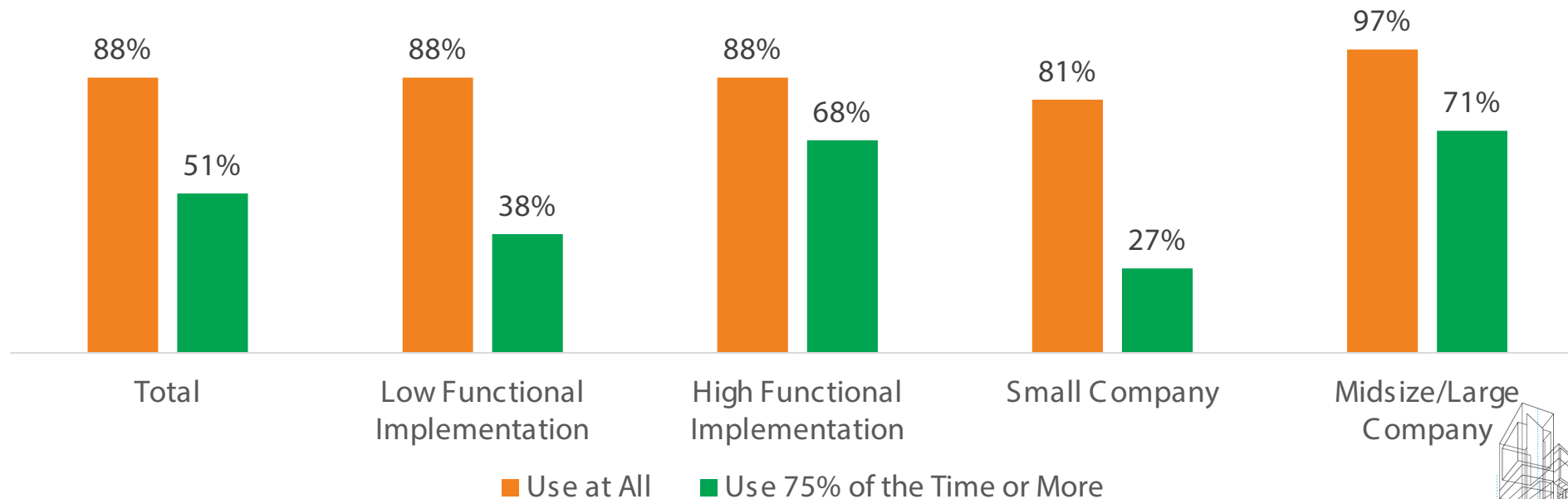
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Use of Technology: Bidding/Estimating

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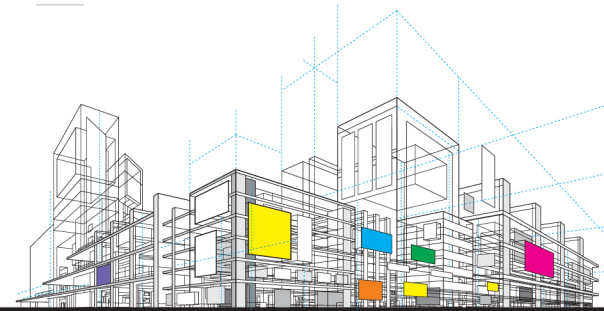


Use of Software: Project Management

Integrate PM Software With GC's

When Systems Are Used in Parallel

80% of those using PM software use it in parallel with the GC's software at least some of the time. Integration with the GC software happens, but it is not common.

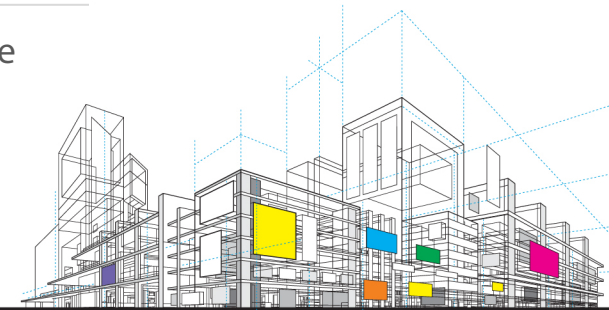
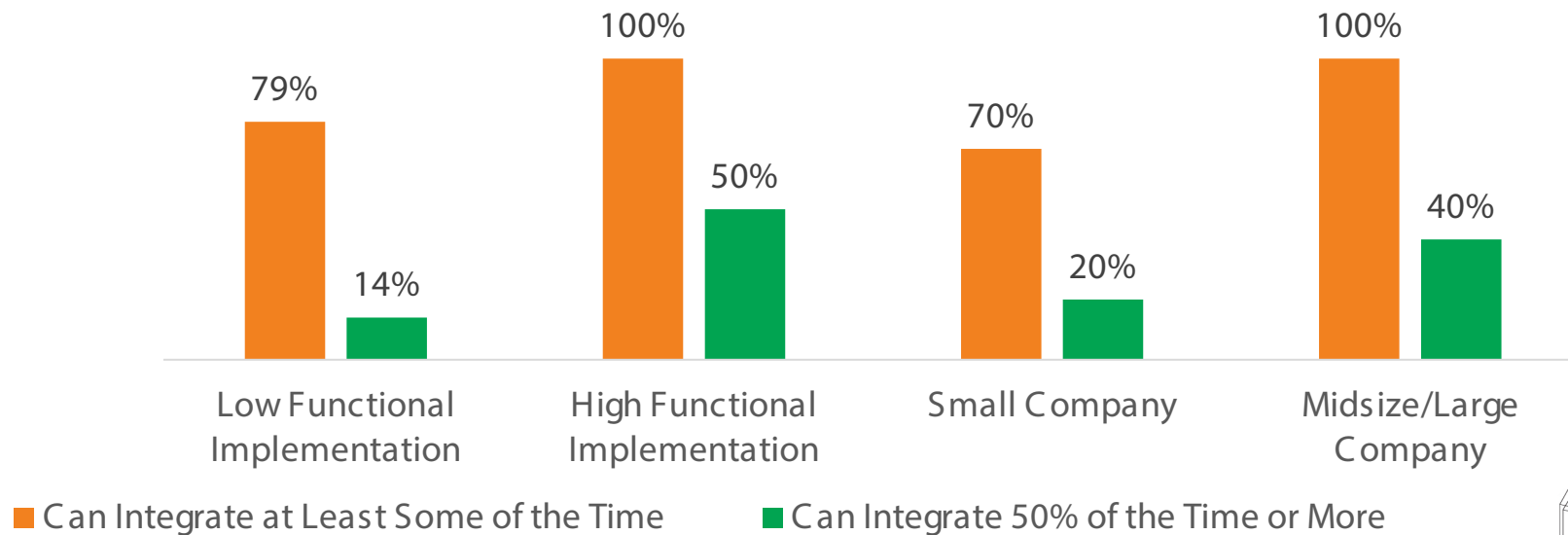


Use of Software: Project Management

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When Systems Are Used in Parallel

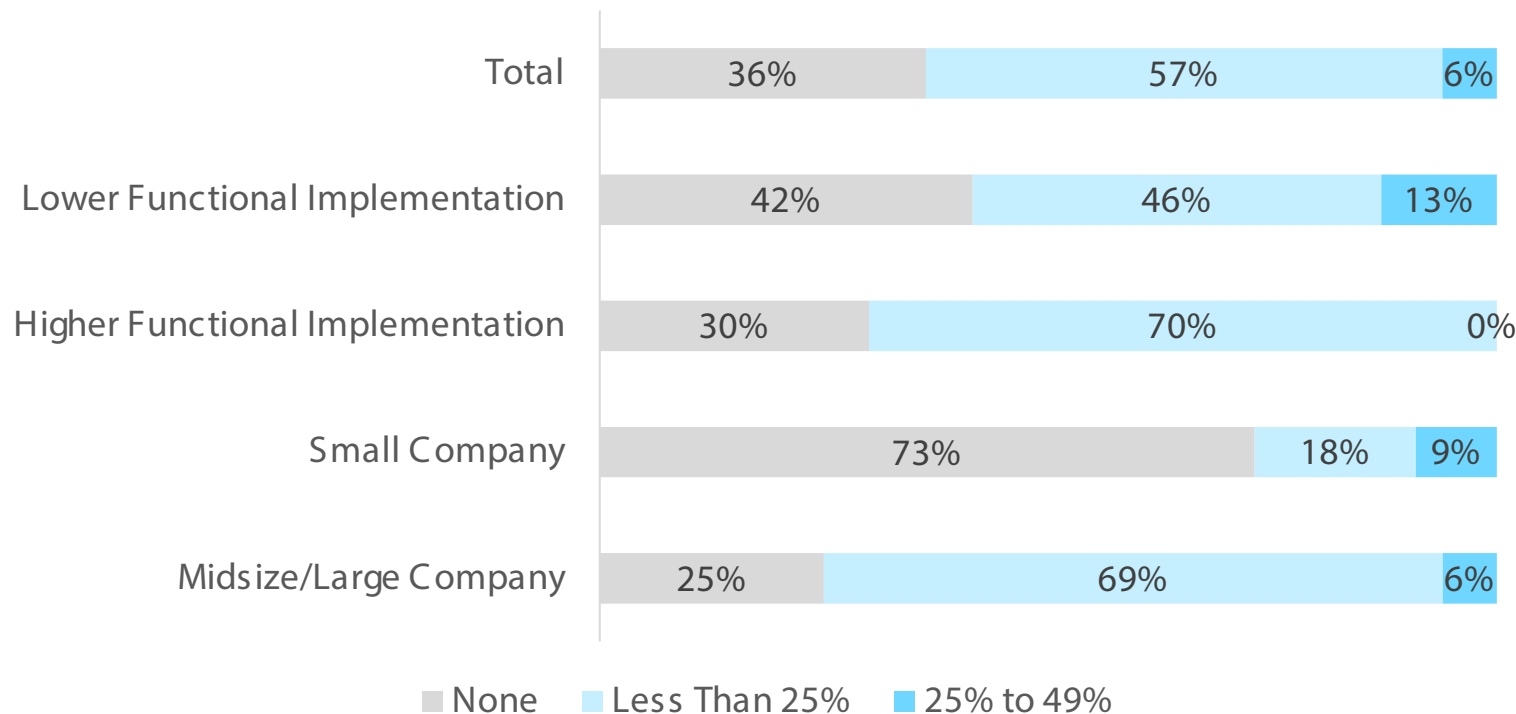
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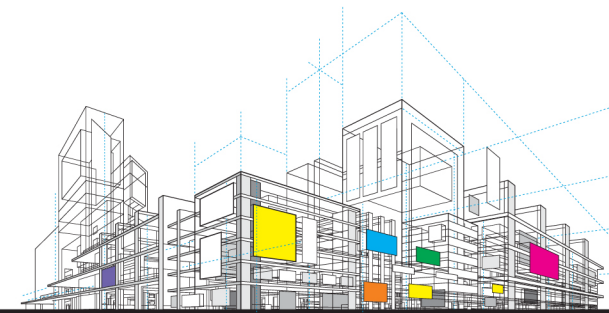
Use of Software: VDC

Outsourcing of VDC Activities

Very few MEP contractors outsource one quarter or more of their VDC activities



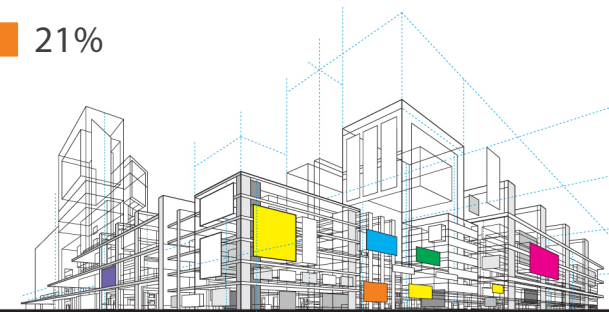
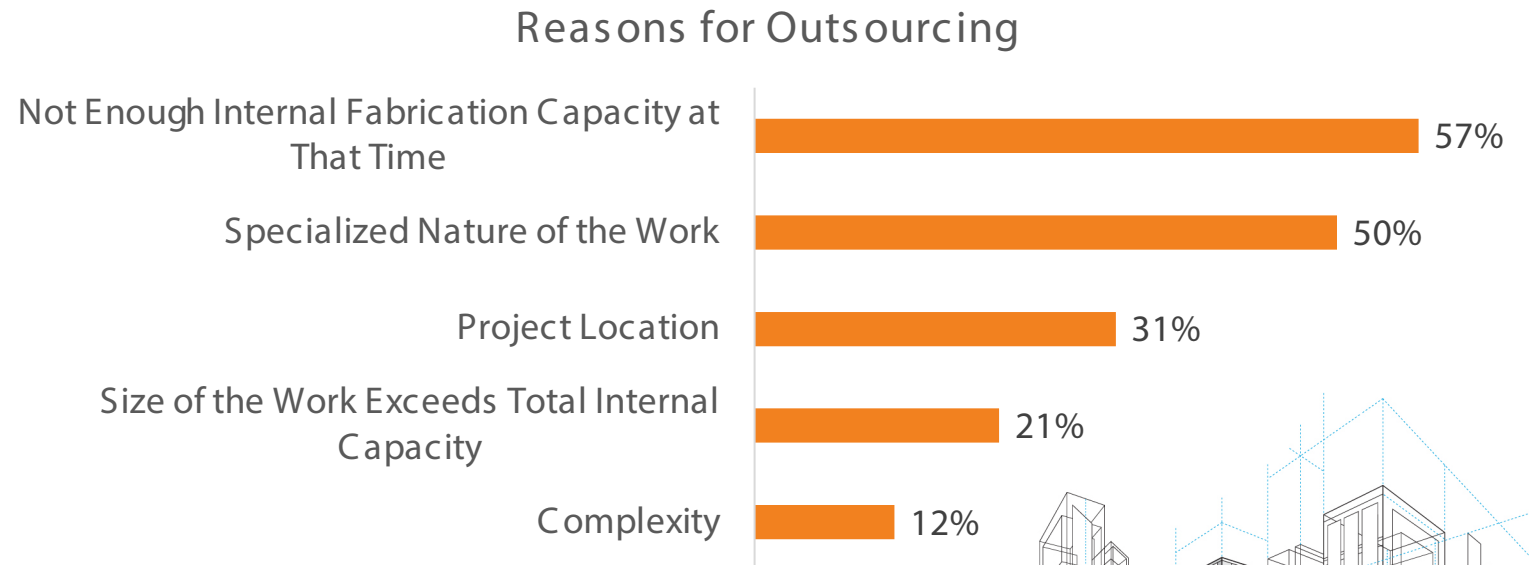
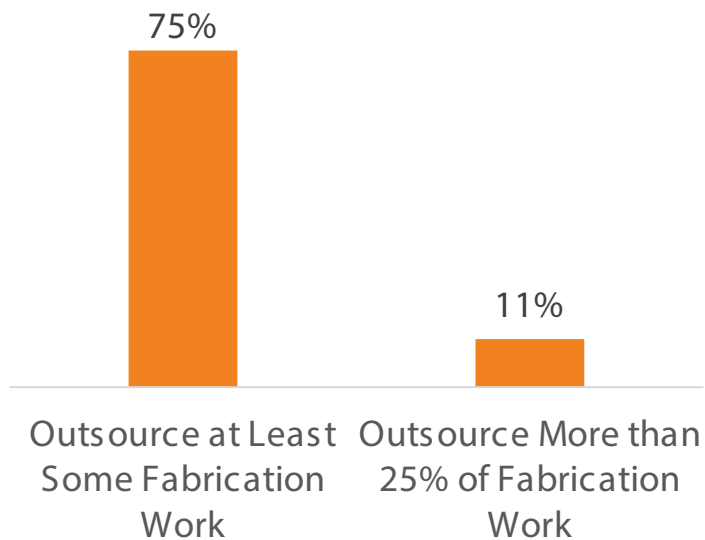
- 96% have employees assigned primarily to VDC activities
- 35% provide VDC services to other companies as a revenue generating activity
- 72% charge project budgets for cost of internal VDC services



Use of Software: Fabrication

Outsourcing Fabrication Work That Could be Fabricated Internally

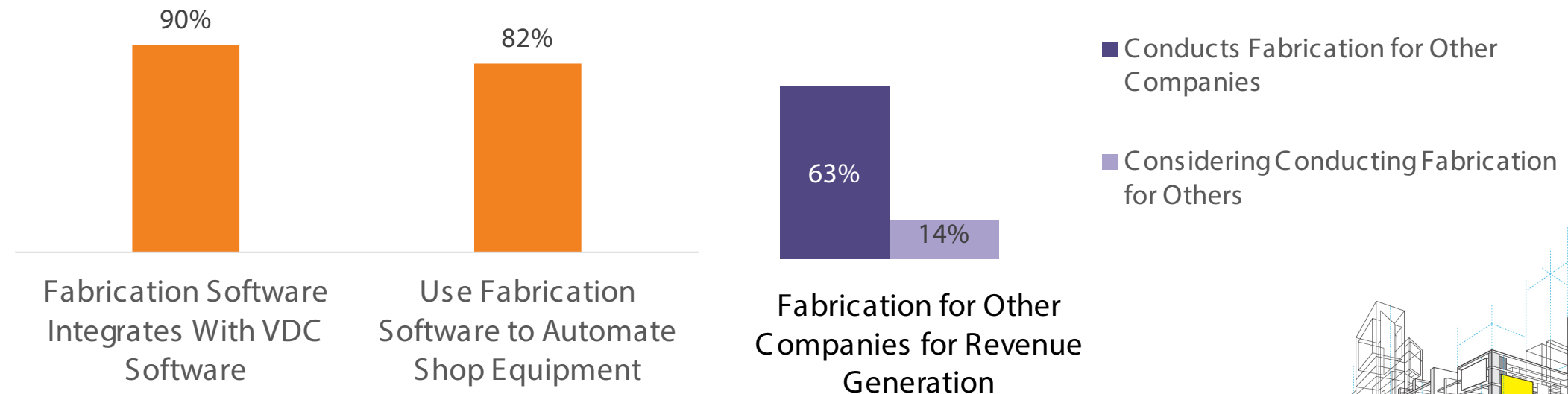
98% have internal fabrication capabilities. Most outsource some fabrication, but usually only due to special circumstances, not as a regular practice



Use of Software: Fabrication

Integration of Fabrication Software and Revenue Generation From Fabrication

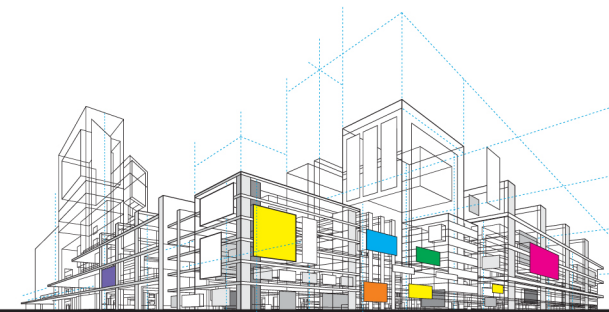
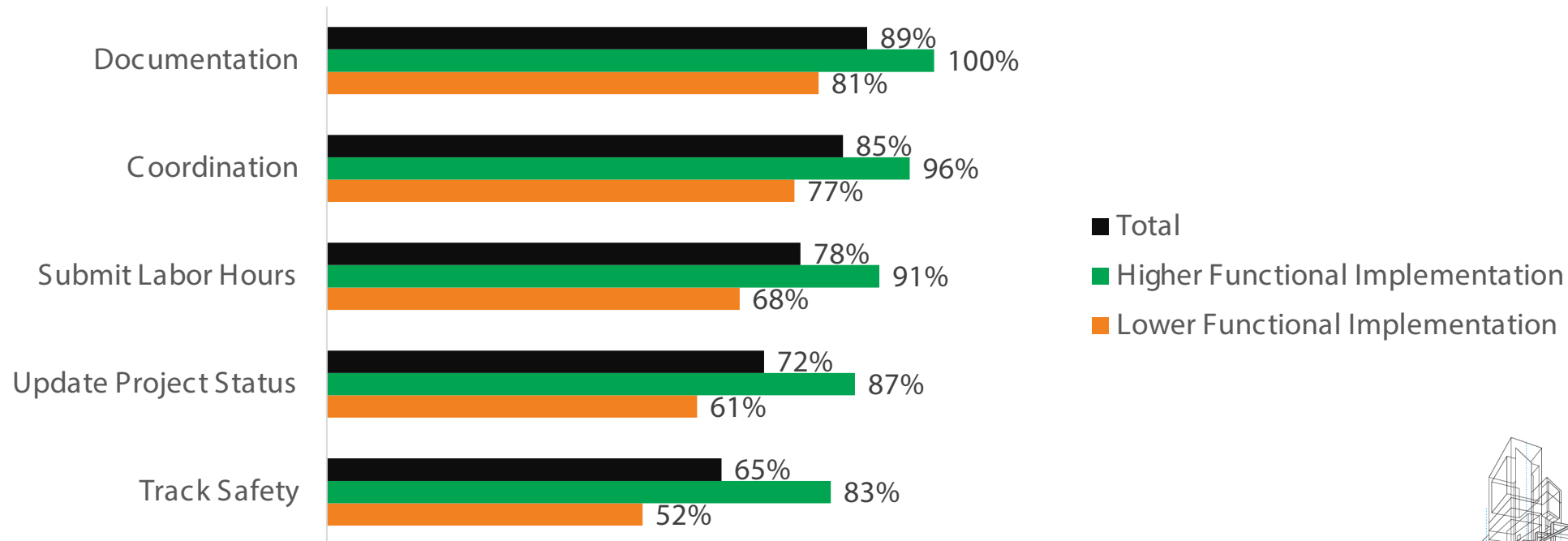
Nearly all using fabrication software



Use of Software: Field

Frequent Uses of Field Software

Nearly all of those implementing the software for more functions in general also have their field software performing most functions.



Agenda

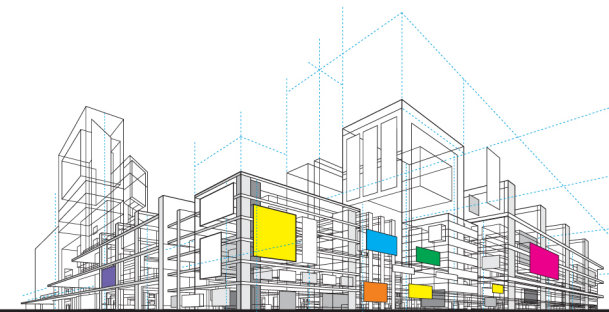
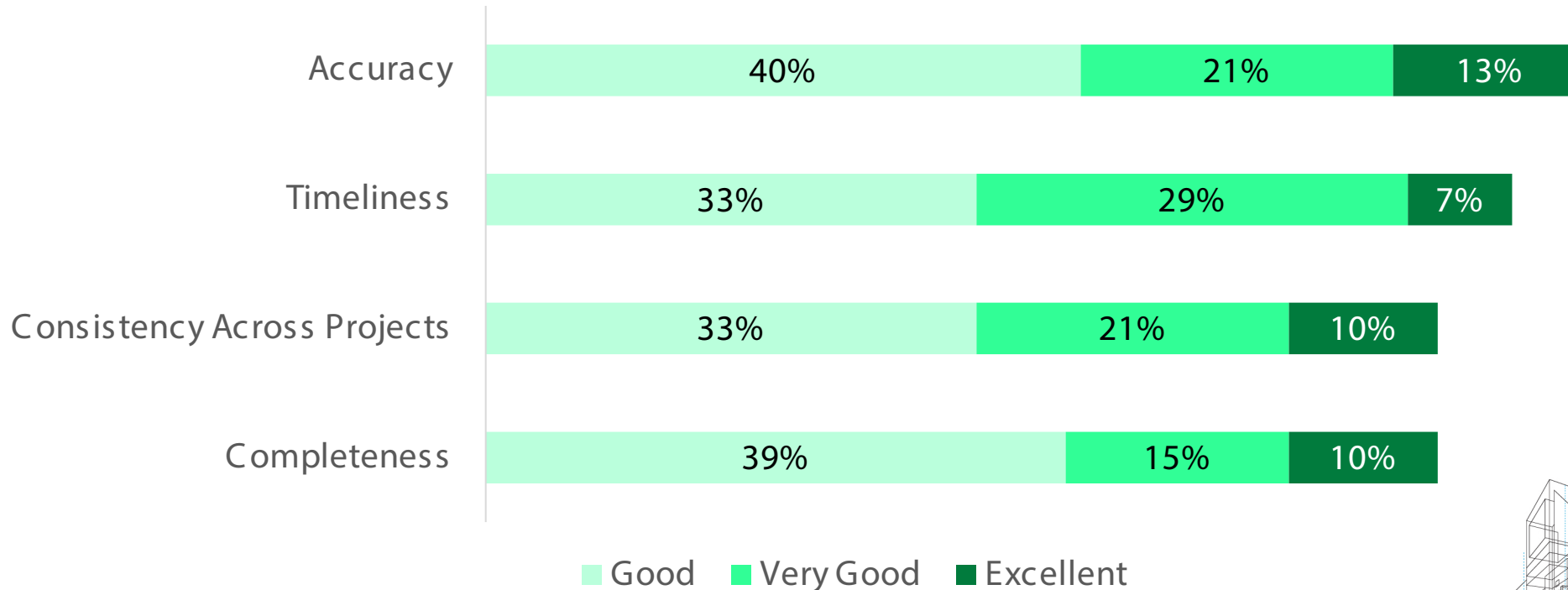
- Study Demographics
- Use and Implementation of Software
- Using Data
 - **Data Quality**
 - Data Sharing
 - Data Management
- Company Engagement With Tech



Using Data: Data Quality

Rating of Data Quality From Technology Solutions

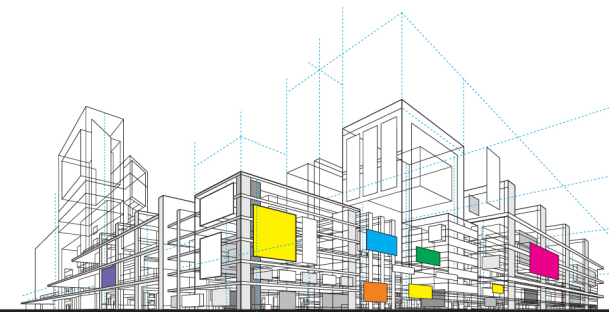
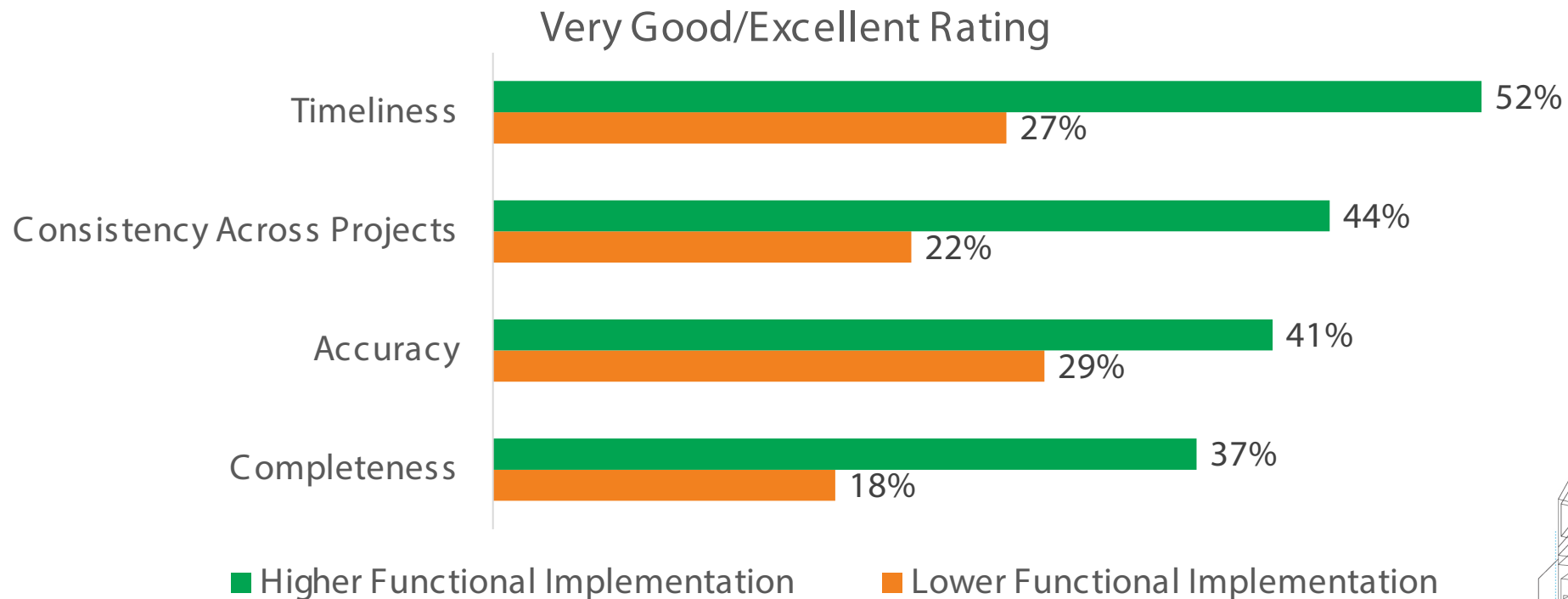
The majority of contractors report that their data quality across several measures is at least good, but few describe it as excellent.



Using Data: Data Quality

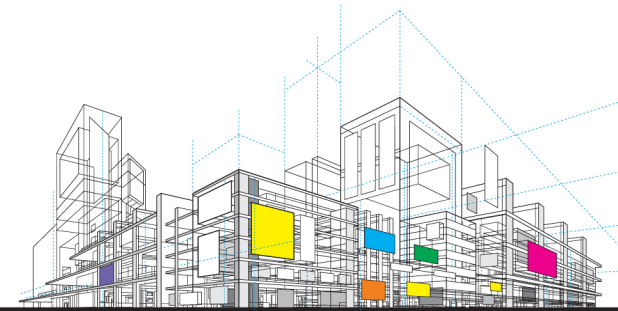
Rating of Data Quality From Technology Solutions

Contractors with higher functional implementation levels have better data quality than those with lower functional implementation.



Agenda

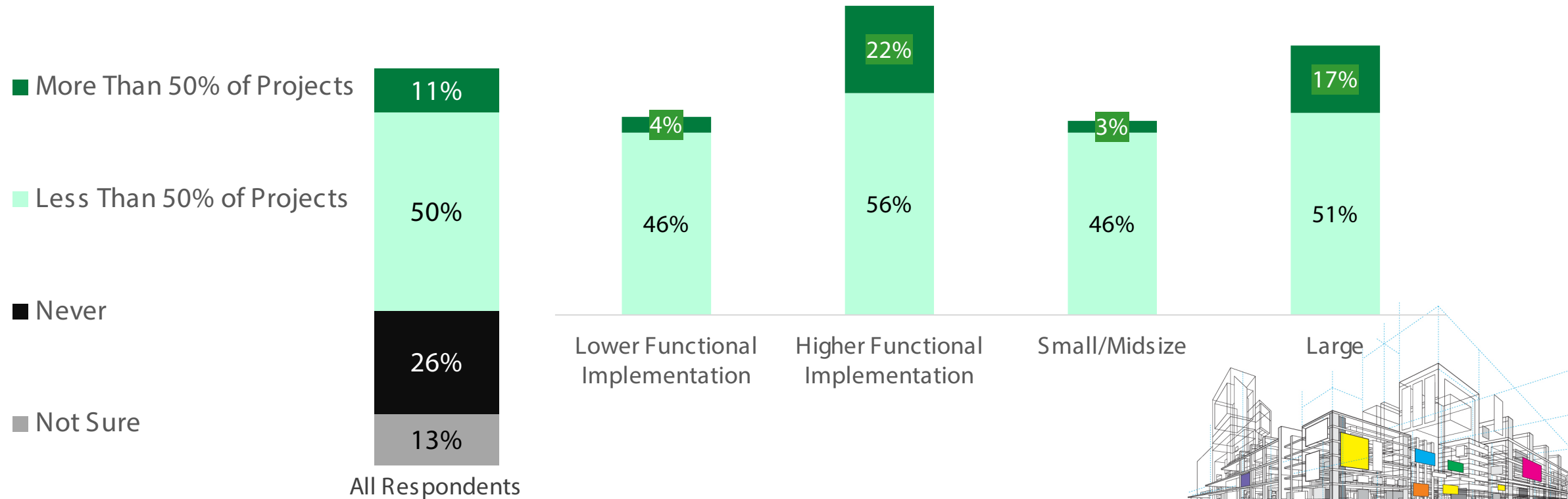
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Using Data: Data Sharing

Frequency of Sharing Data With Other Contractors

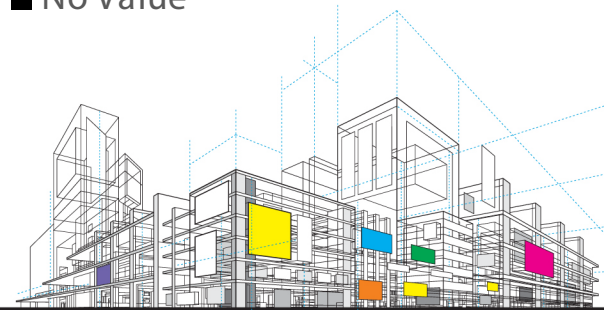
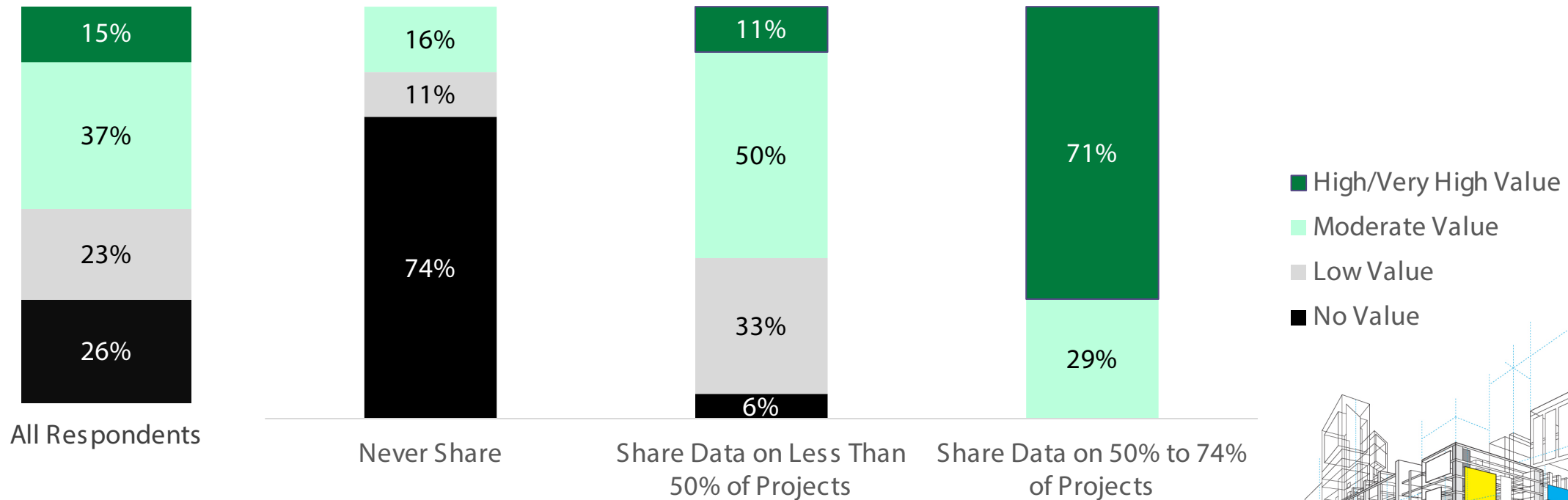
Few contractors overall share data with other contractors on more than 50% of their projects, but those with higher functional implementation do so the most.



Using Data: Data Sharing

Value of Sharing Data With Other Contractors

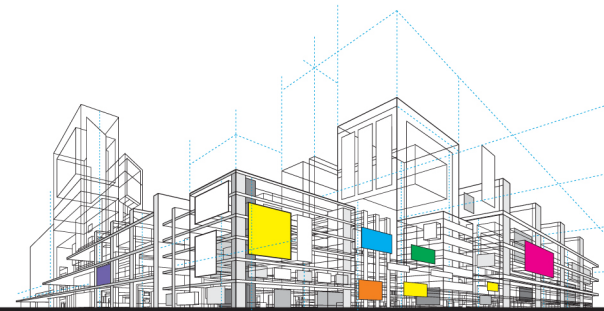
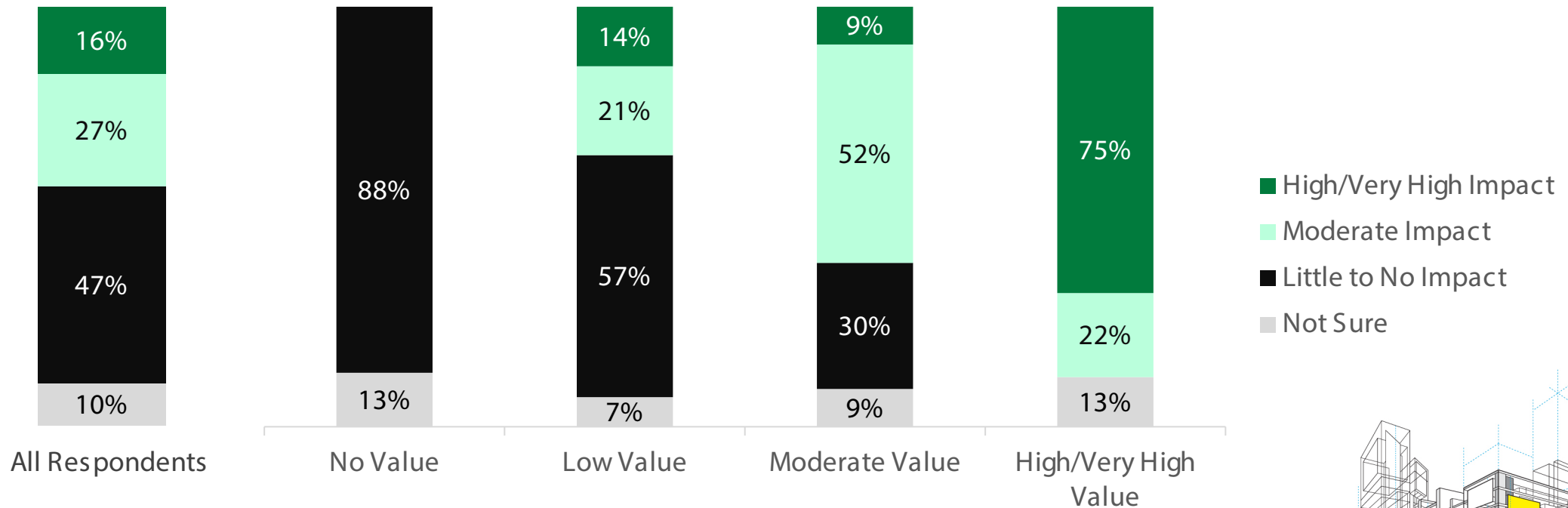
Contractors who share data regularly find it to be a highly valuable practice.



Using Data: Data Sharing

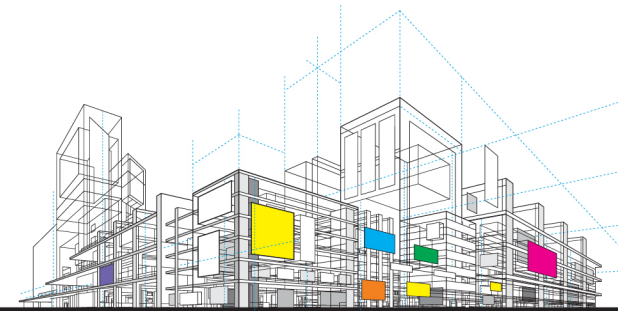
Impact of Technology on Ability to Share Data

The importance of tech for sharing data is determined by the value placed on that activity.



Agenda

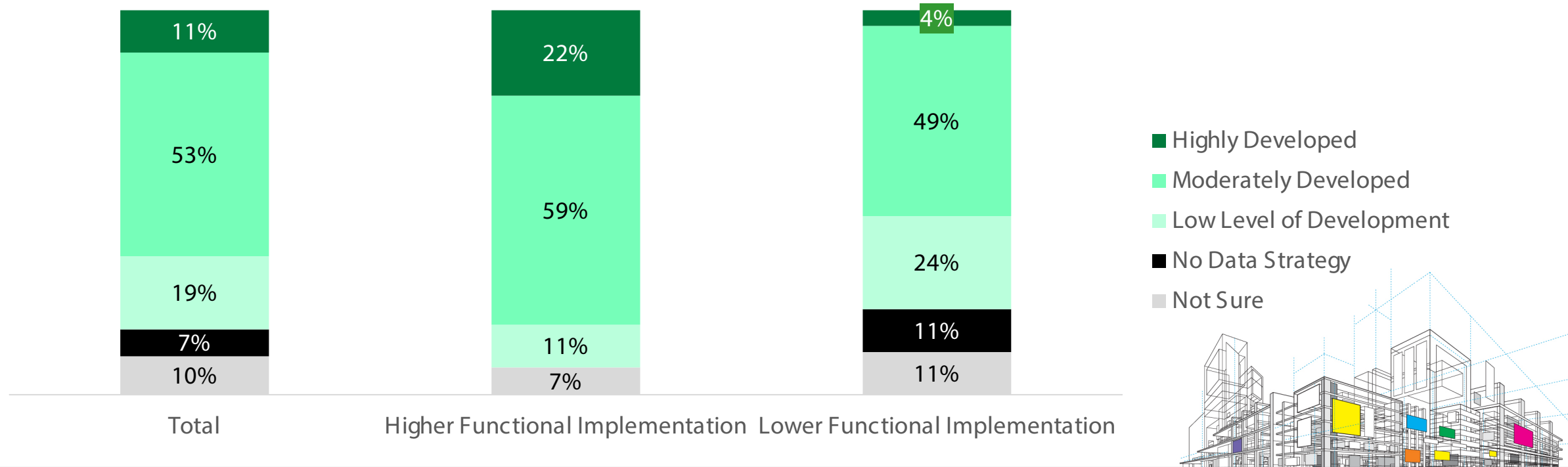
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Using Data: Data Management

Development of a Data Management Strategy

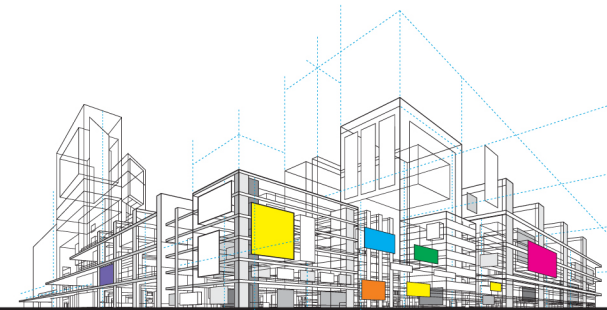
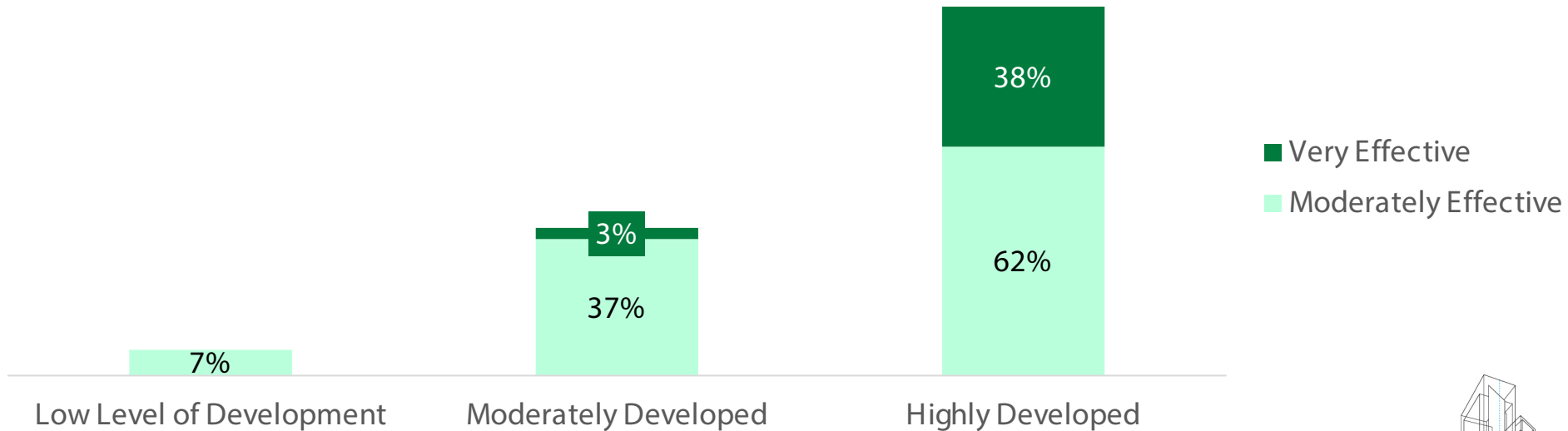
Most of the respondents have a data management strategy, but few regard it as highly developed.



Using Data: Data Management

Effectiveness of Data Management Strategy

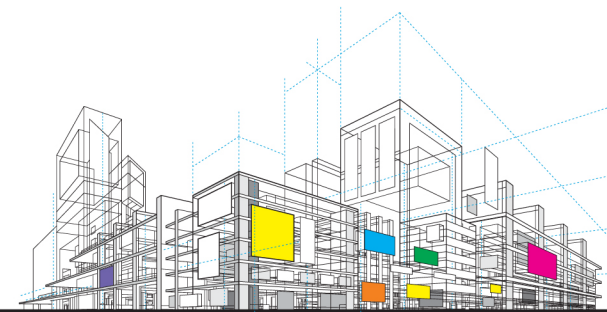
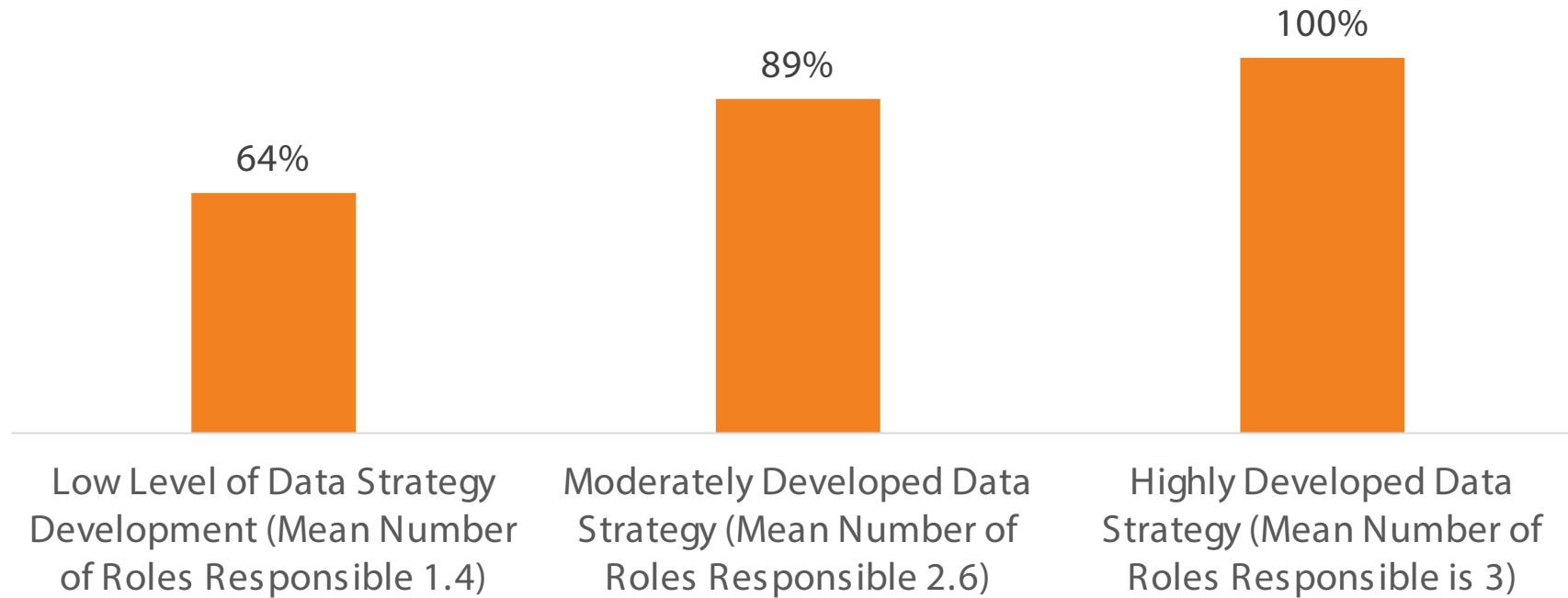
The more highly developed the data management strategy is, the more likely it is to be considered effective.



Using Data: Data Management

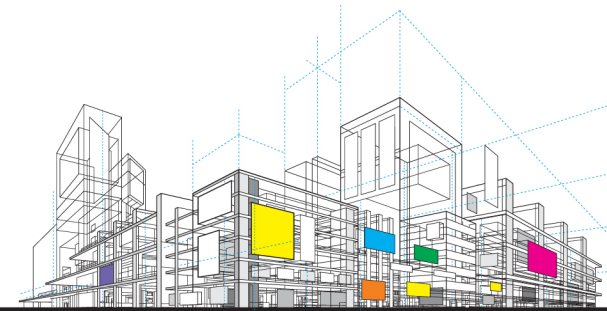
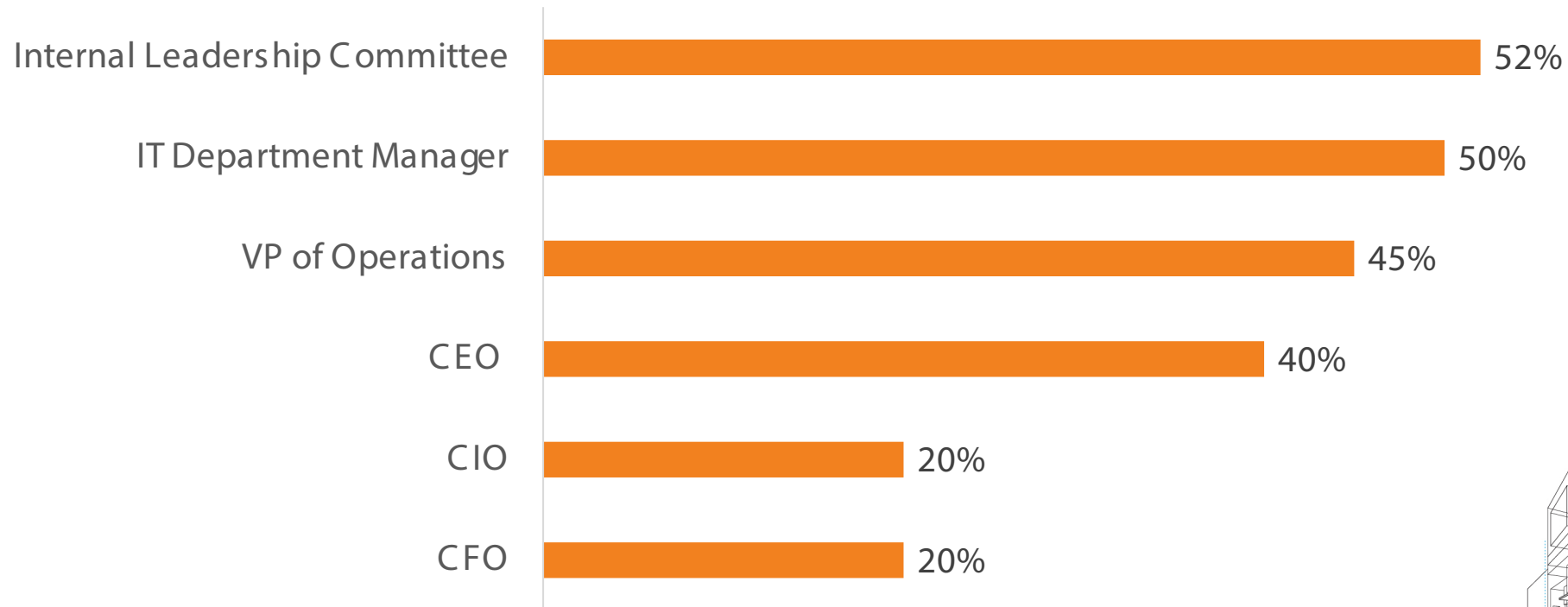
Companies With at Least One Role Responsible for Their Data Strategy

The more developed the data management strategy is, the higher number of roles are responsible for it.



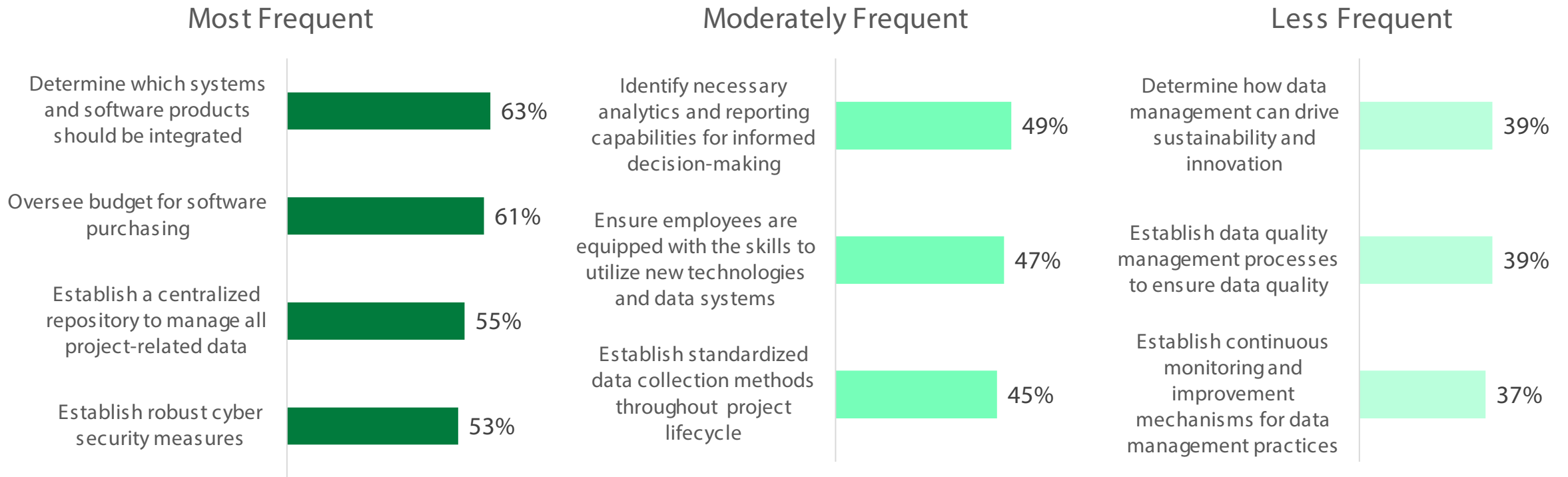
Using Data: Data Management Roles With Responsibility for Data Strategy

The roles most frequently entrusted with responsibility for data strategy are internal leadership committees, IT managers, VP of operations and CEOs.



Using Data: Data Management Responsibilities of Those in Charge

Most frequent responsibilities involve software functionality and security, but data quality measures are among the least frequent.



Agenda

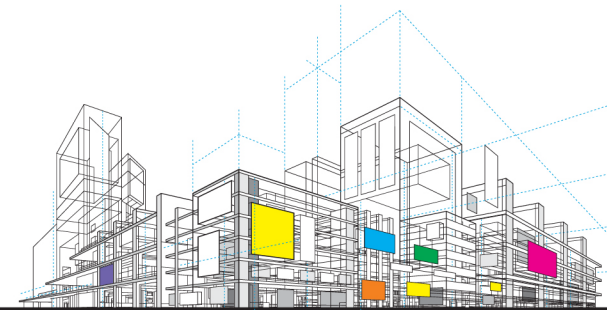
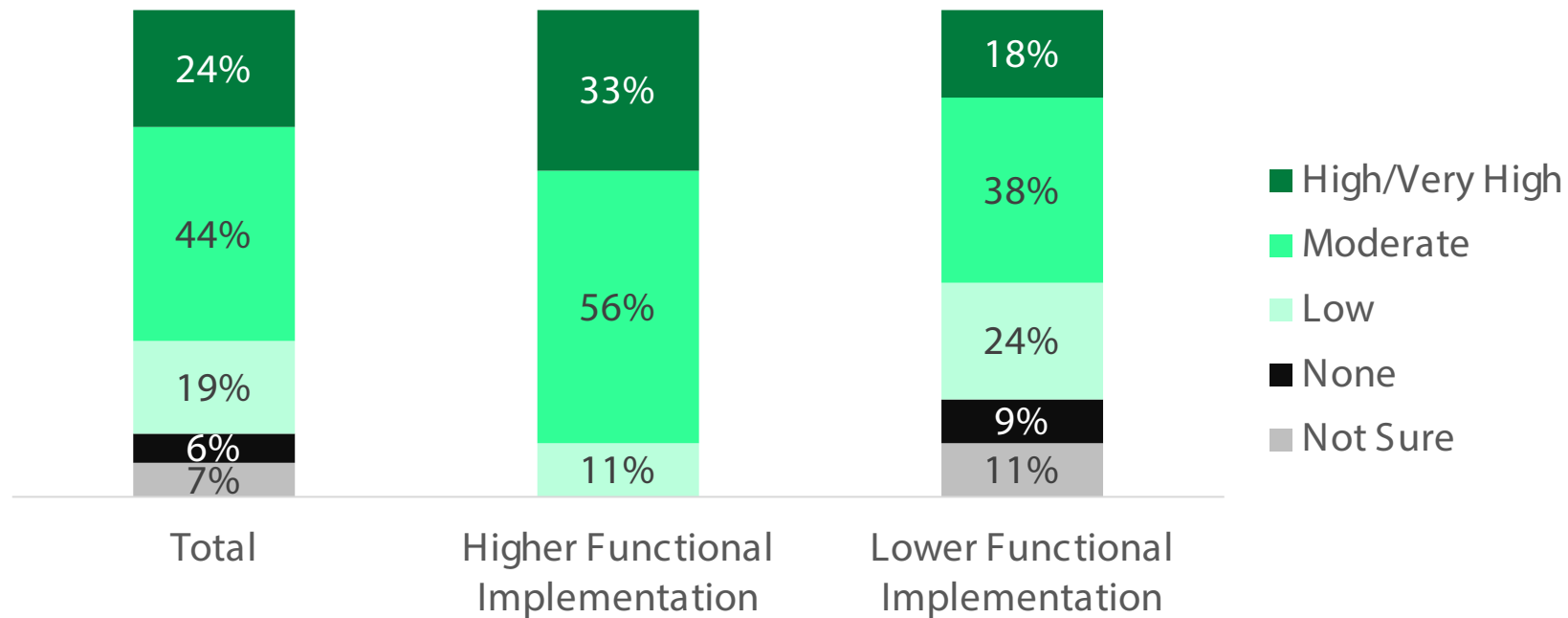
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- **Company Engagement With Tech**



Company Engagement With Technology

Internal Capability to Implement Integrations, Customizations, Etc.

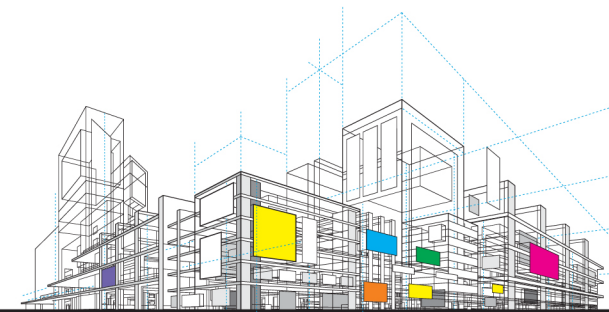
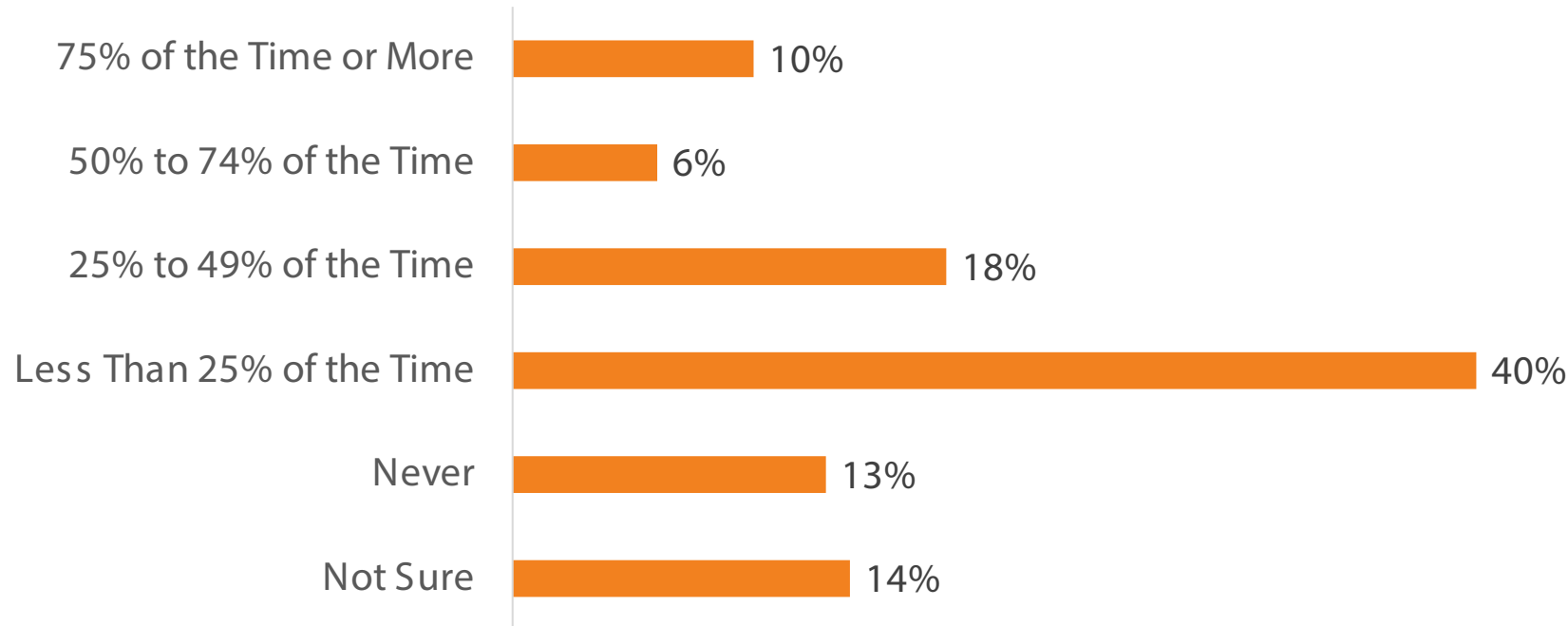
Internal capabilities are common, but most rate those capabilities as moderate.



Company Engagement With Technology

Frequency of Outsourcing Integrations, Customizations, Etc.

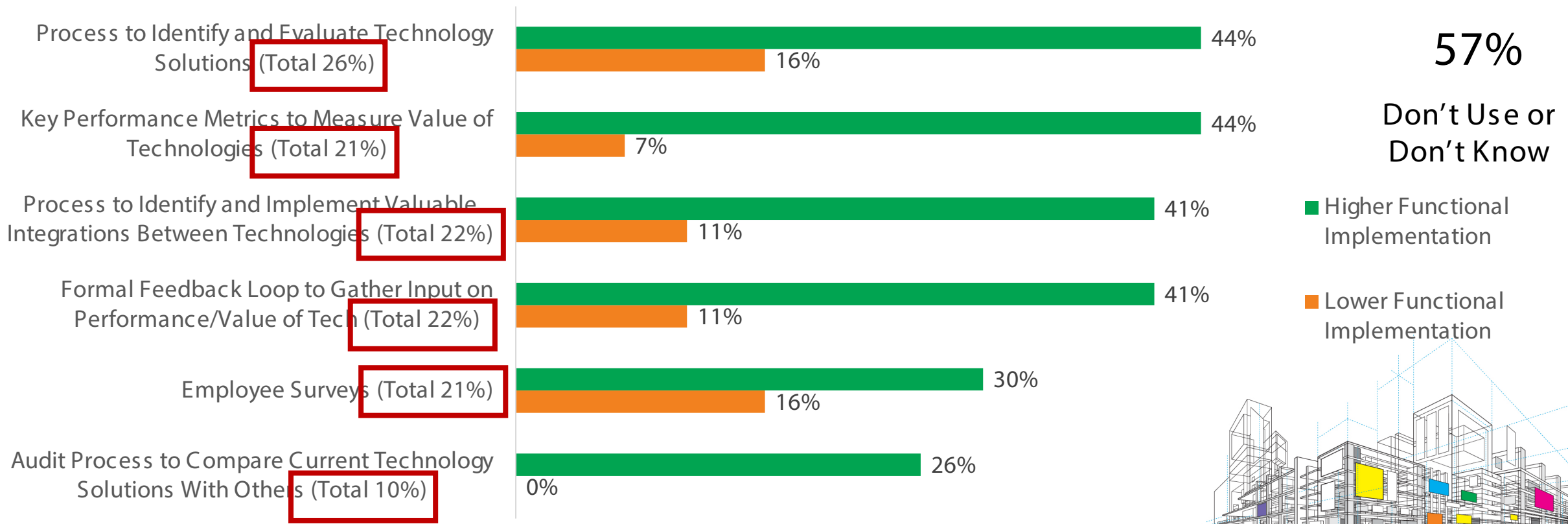
Nearly three quarters outsource some of these tech functions, but only 16% do so more than 50% of the time.



Company Engagement With Technology

Use Six Metrics/Processes to Manage Tech Portfolio

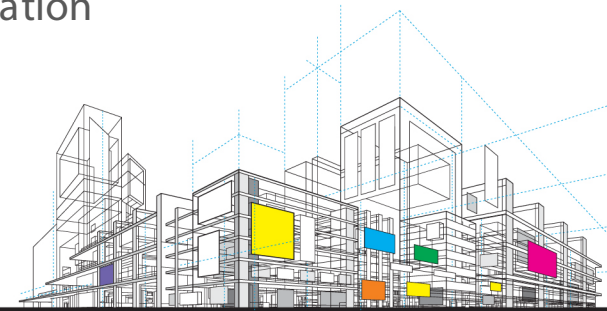
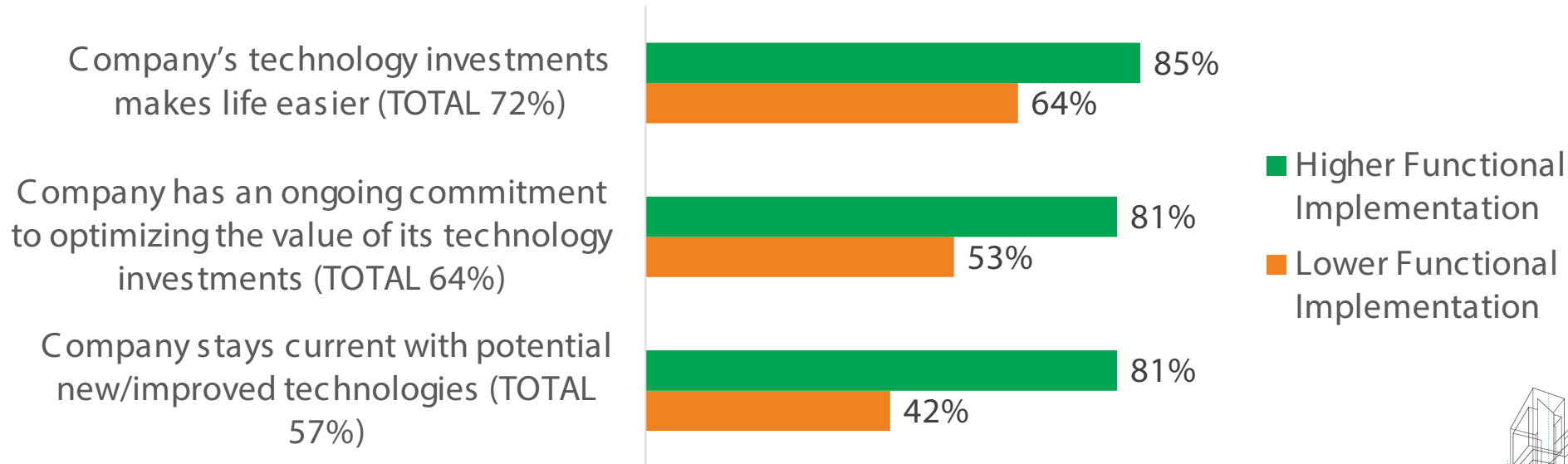
Only 43% report that they use the six metrics/processes in the bar chart below to manage their technology portfolio.



Company Engagement With Technology

Agreement With 9 Statements About Their Company's Engagement with Technology

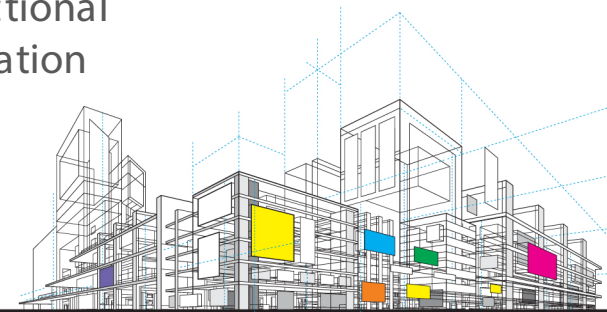
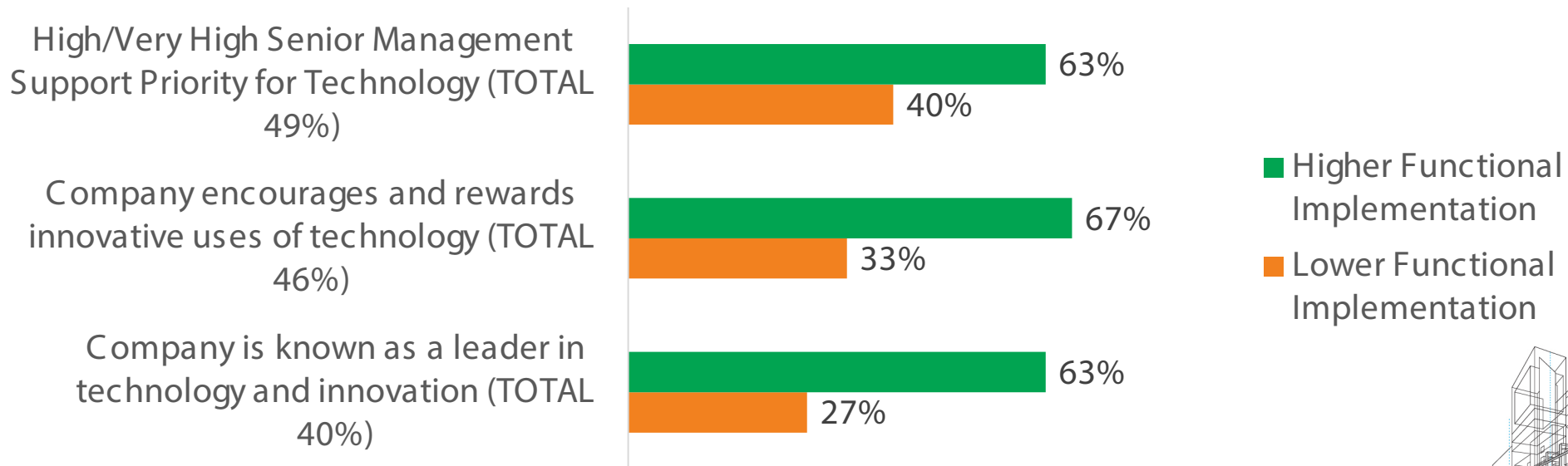
Majority of respondents agree that their company's technology investments make their lives easier and see an overall commitment to optimizing the use of technology at their organization.



Company Engagement With Technology

Agreement With 9 Statements About Their Company's Engagement with Technology

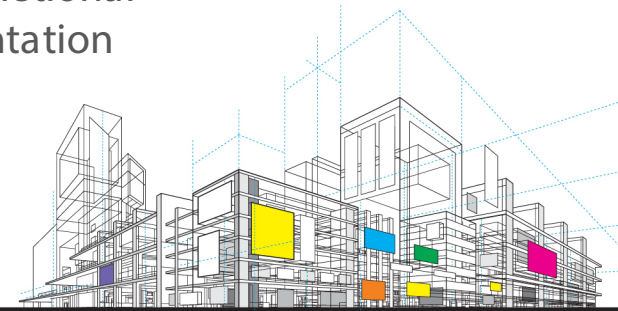
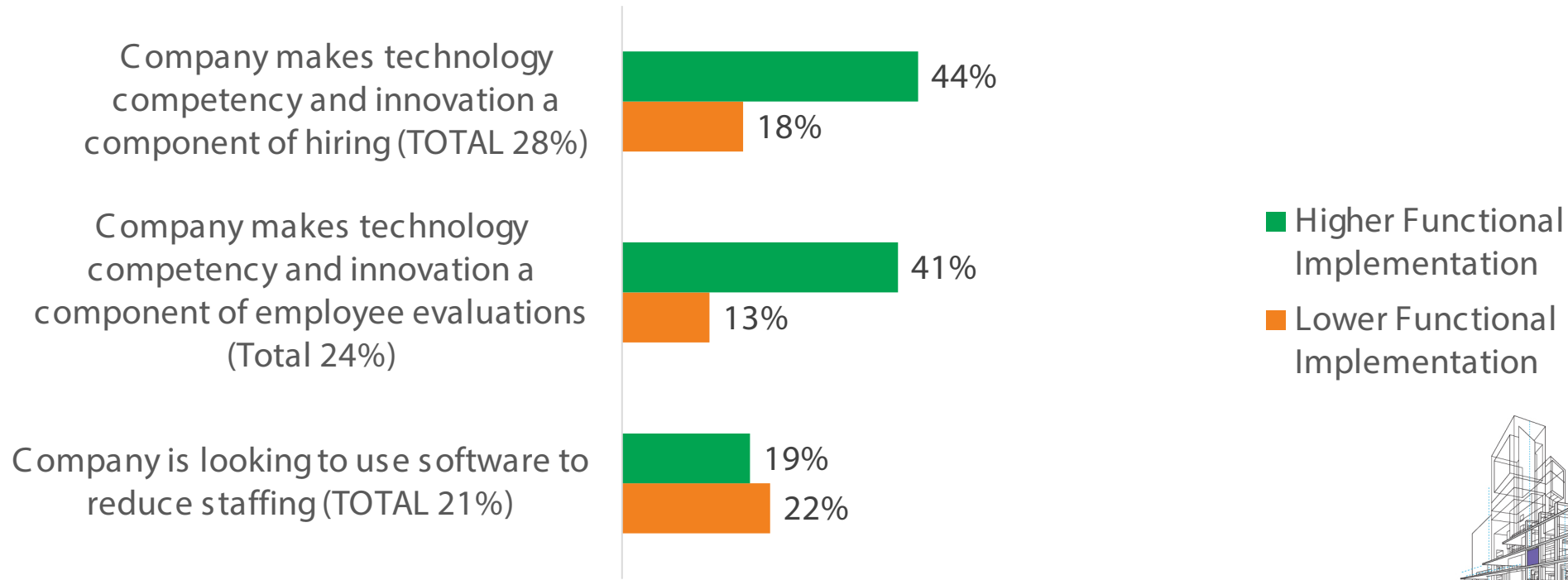
Those with higher functional implementation far more frequently encourage innovative use of technology at their company and tend to be known as leaders in technology and innovation.



Company Engagement With Technology

Agreement With 9 Statements About Their Company's Engagement with Technology

Very few use technology to reduce staffing, but it is also uncommon to prioritize technology competency/innovation in hiring or evaluation of staff.



Final Thoughts

- MEP Contractors are active users of software for core functions of work, but ERP systems are still not common.
- They are moderately advanced in integrations internally, but there is disagreement about the value of sharing data with other contractors. Technology impacts that ability, but only for those who value sharing that data.
- Organizations with effective data management strategies have people in multiple roles responsible for the strategies.
- Those who get the most functional uses out of their software:
 - Have internal capabilities to manage integrations etc.
 - Report better data quality
 - More frequently report that technology makes life easier at their company
 - More frequently share data with other contractors
 - Use metrics and processes to manage their technology portfolios
 - Seek employees with strong tech capabilities

