



HUMANIZING BIG DATA IN CONSTRUCTION



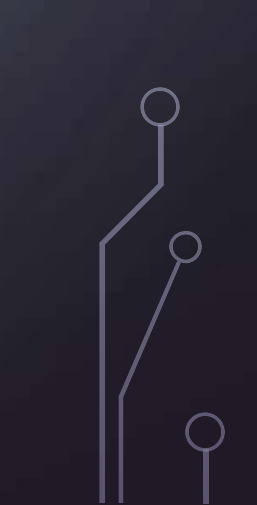
AGC SURETY BONDING AND CONSTRUCTION RISK MANAGEMENT CONFERENCE

HYATT REGENCY COCONUT BONITA SPRINGS, FLORIDA

JANUARY 28, 2020



INTRODUCTIONS

- **Rose Hoyle, PE, CRIS (moderator)**
Strategic Operations Manager for Risk Engineering, AXA XL NA Construction
 - **Dr. Donna Laquidara-Carr**
Industry Insights Research Director, Dodge Data & Analytics
 - **Doug Ware**
VP of Risk Management, Suffolk Construction
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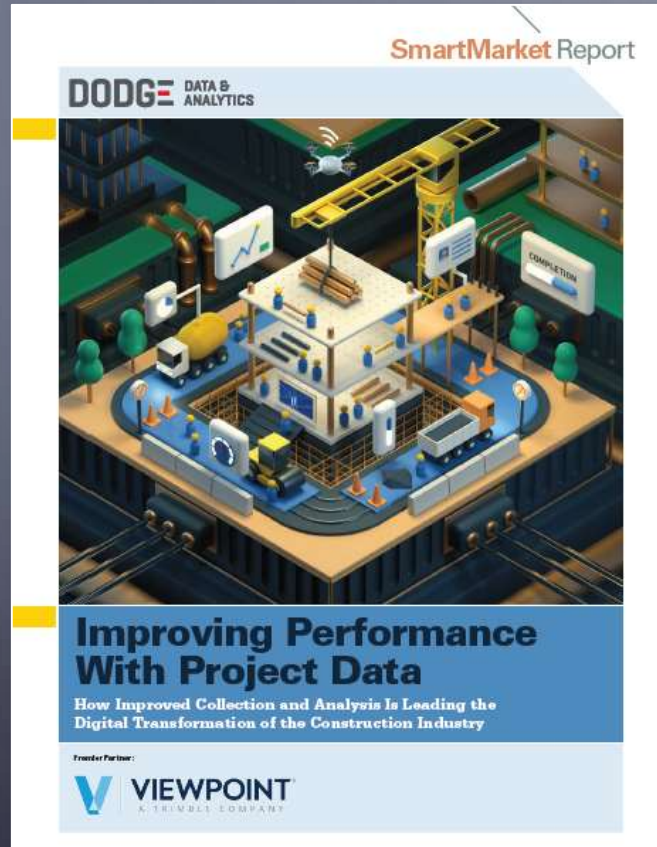


WHAT DOES THE DATA TELL US?

Dr. Donna Laquidara-Carr
Industry Insights Research Director

DODGE DATA &
ANALYTICS

IMPROVING PROJECT PERFORMANCE WITH DATA SMARTMARKET REPORT



➤ Online Survey of 187 Contractors

- 61% GC/CM/Design-Builders
- 39% Specialty Trade Contractors

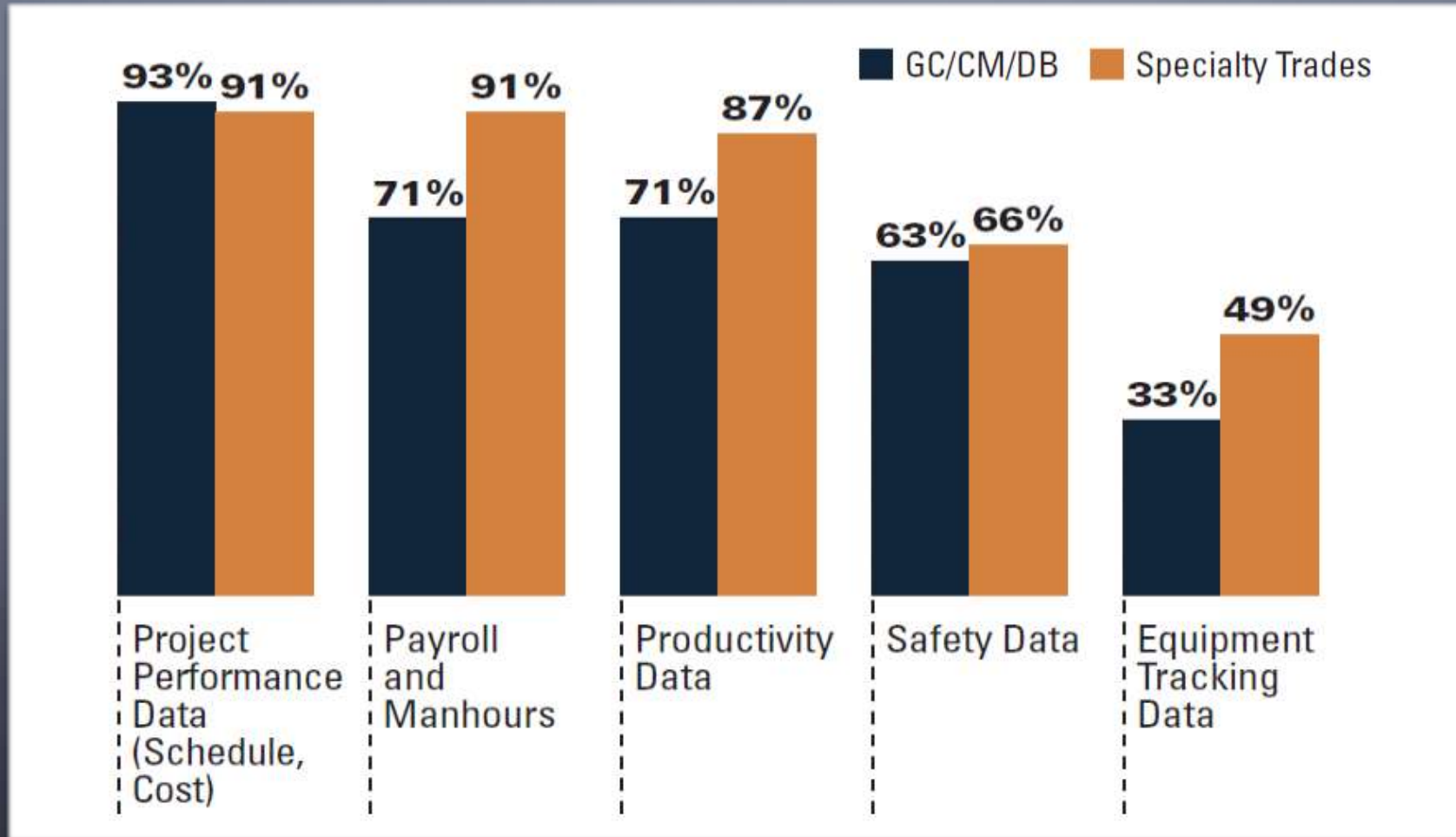
➤ Respondents had to collect data in one of the following categories:

- Productivity
- Payroll and manhours
- Equipment Tracking
- Safety
- Project Performance

Available at: www.construction.com/toolkit/reports

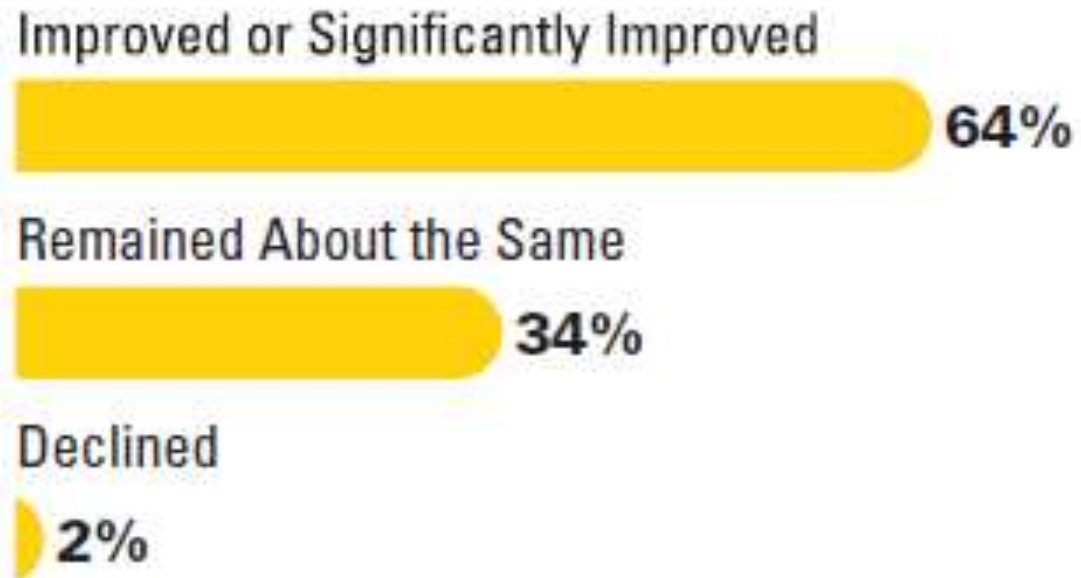
MOST IMPORTANT DATA TO GATHER

HIGH/VERY HIGH VALUE



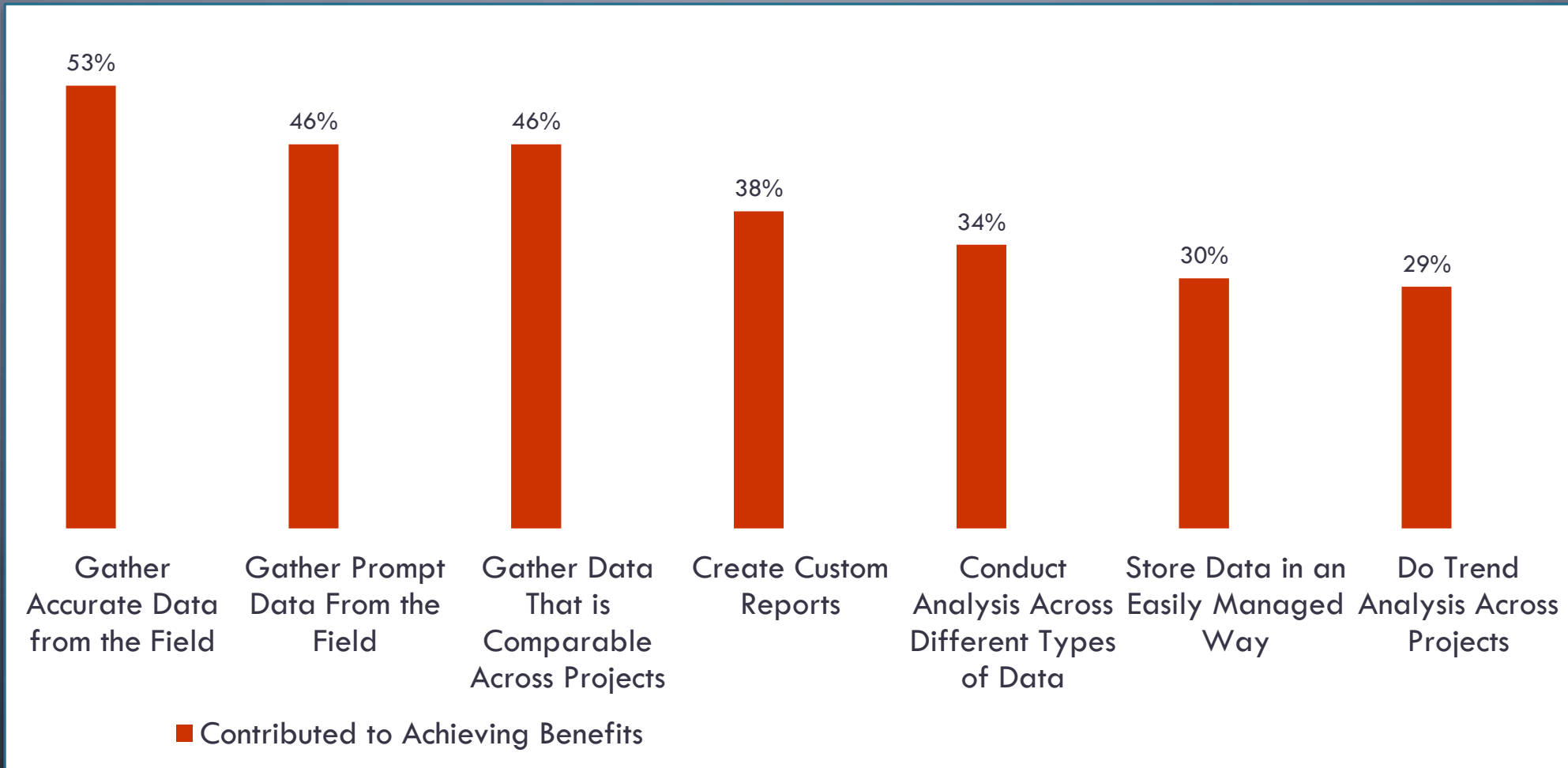
IMPROVEMENT IN DATA GATHERING

IN THE LAST 3 YEARS



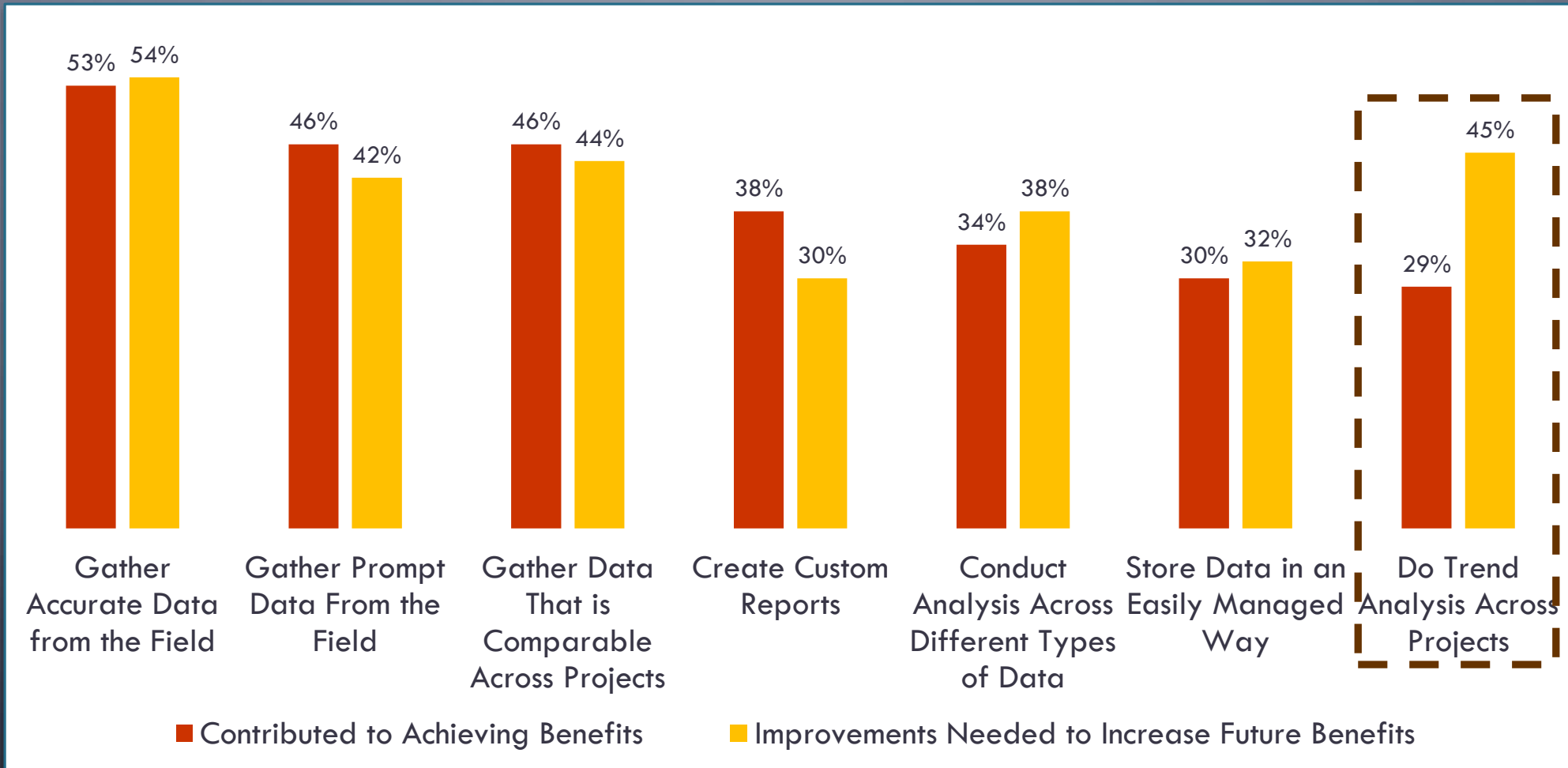
CAPABILITIES THAT CREATE BENEFITS

PERCENTAGE SELECTED BY CONTRACTORS



CAPABILITIES THAT CREATE BENEFITS

PERCENTAGE SELECTED BY CONTRACTORS



USING TECHNOLOGY TO IMPROVE RISK MANAGEMENT IN CONSTRUCTION SMARTMARKET INSIGHT



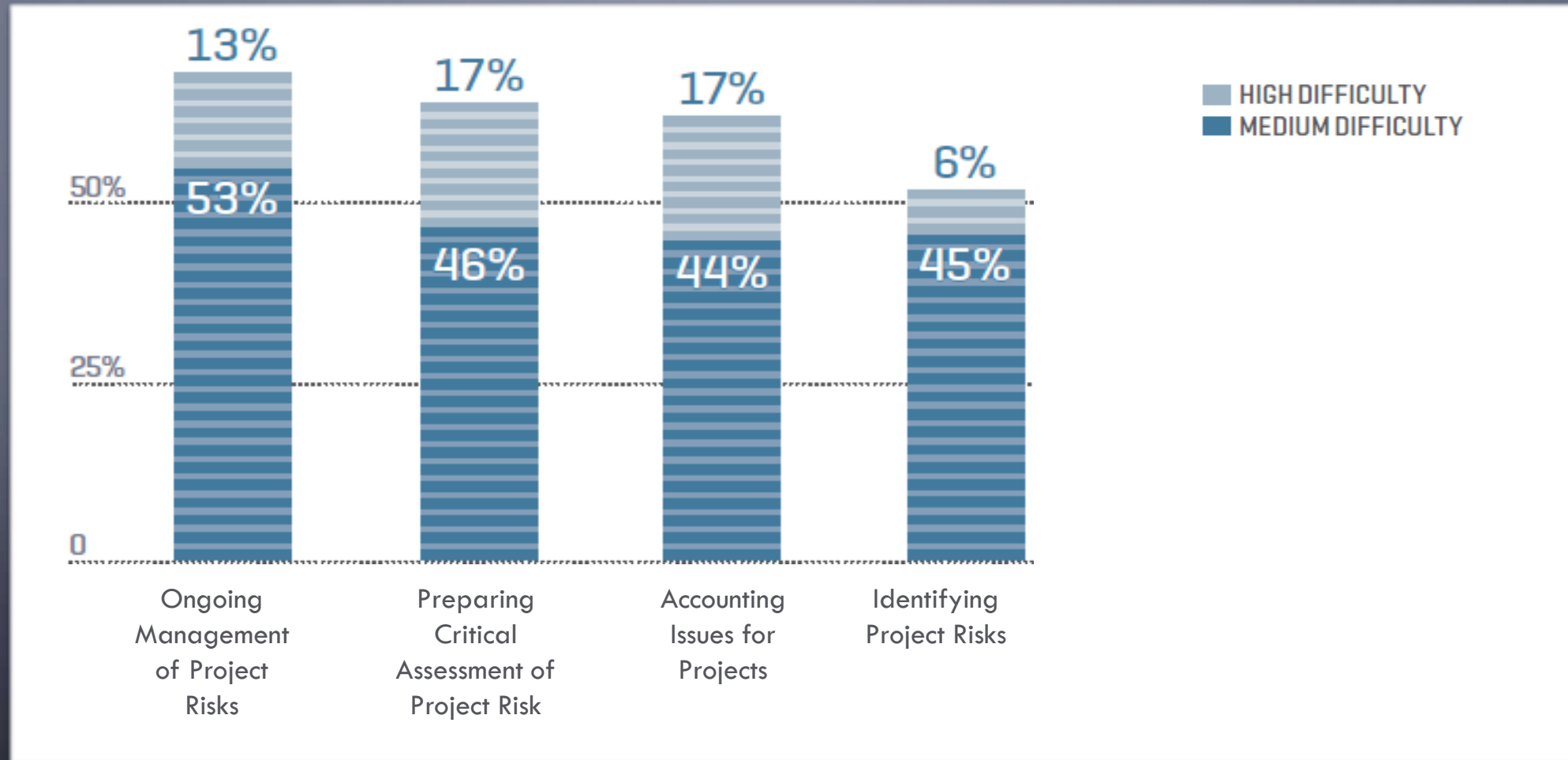
➤ Online Survey of 135 Contractors

- 59% GC/CM/Design-Builders
- 41% Specialty Trade Contractors

➤ Qualitative in-depth interviews with 12 representatives from 10 insurance companies and brokerages

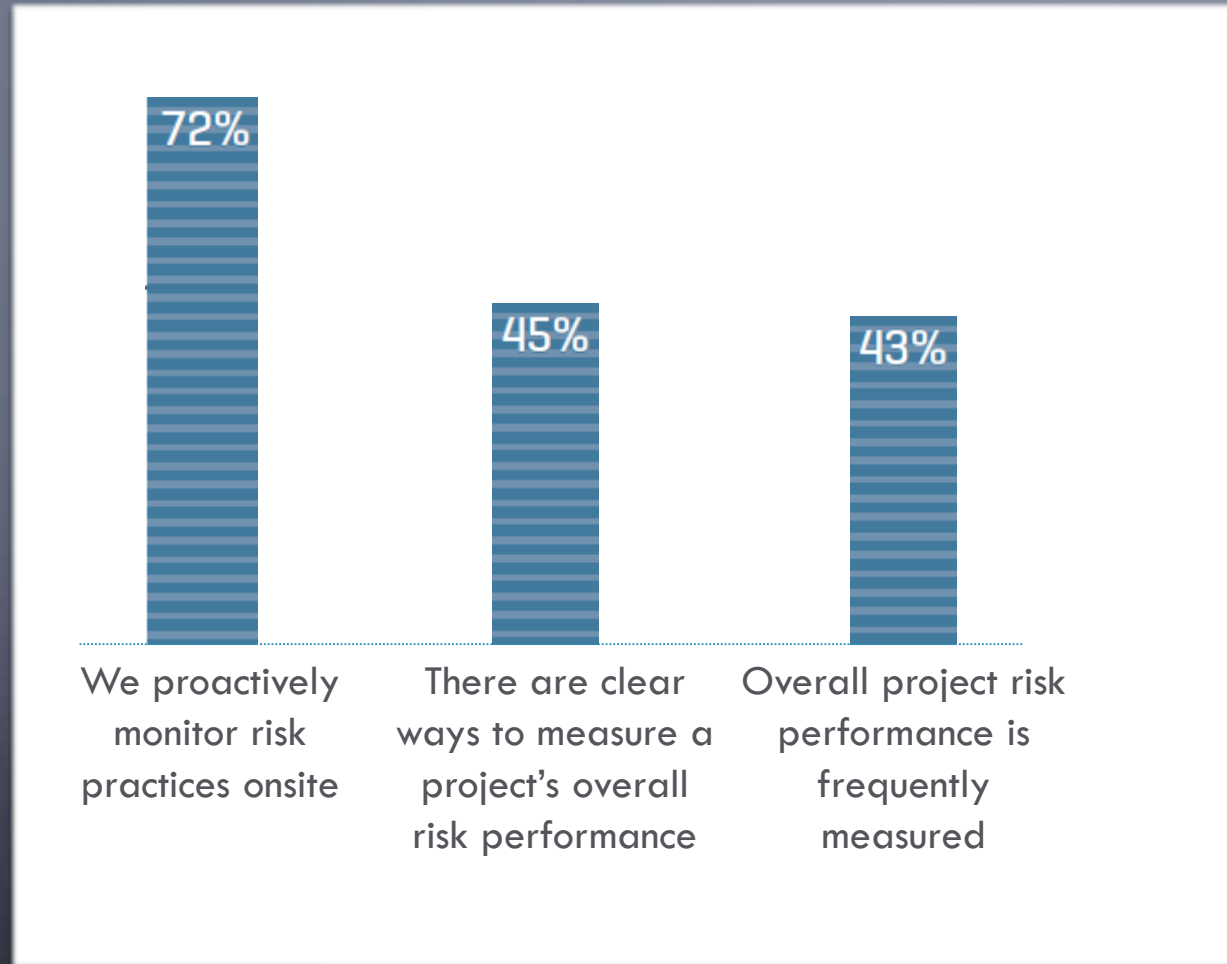
Available at: www.construction.com/toolkit/reports

MOST CHALLENGING RISK MANAGEMENT ACTIVITIES



MEASURING RISK PERFORMANCE

STRONGLY/SOMEWHAT AGREE



COLLECTING AND ANALYZING DATA

	Small Companies	Medium Companies	Large Companies
Collecting Digital Safety and Risk Data	38%	53%	76%
Analyzing Raw Safety and Risk Data	36%	62%	81%
Incorporating Raw Safety and Risk Data Into Existing Data Sets	36%	43%	64%
Developing and Acting Upon Key Safety and Risk Insights	62%	81%	87%

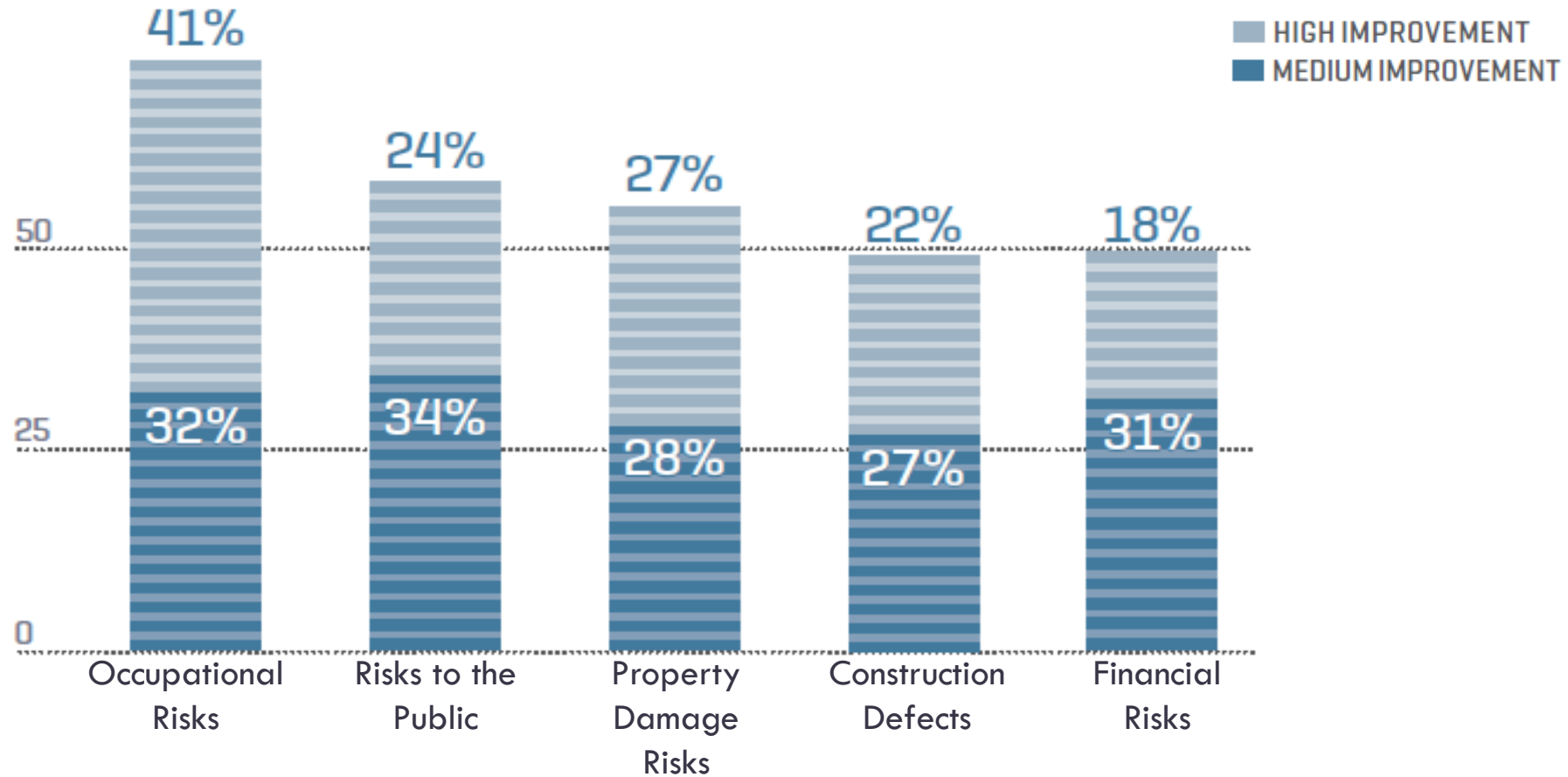
CONTRACTOR EFFECTIVENESS AT GATHERING DATA

COMMENTS FROM INSURER'S IN-DEPTH INTERVIEWS

- “ The majority are [gathering data] at a very basic level ...[Those using technology are in] an exploratory phase: smaller proof of concepts, pilots ... ”
- “ I don't think they gather data to measure risk outside of risk of performance, and health and safety. ”

TYPES OF RISK THAT IOT CAN HELP ADDRESS

ACCORDING TO CONTRACTORS



TECHNOLOGIES THAT ADDRESS OCCUPATIONAL RISK

COMMENTS FROM INSURER'S IN-DEPTH INTERVIEWS

- “ It's going to be standard operating procedure that when you show up to work, you get issued your wearable, and you go along as you've always done, but there's data being collected that will be used to mitigate those risks. ”
- “ We're seeing technology that can recognize that a worker is not wearing a hardhat, a ladder isn't secured, someone's not wearing fall protection, or moisture is causing mold. Things that everyday workers may not see and recognize. ”

IMPROVEMENT IN DATA GATHERING

IN THE LAST 3 YEARS

Absorb Costs in Expectation of Long-Term Gains



Pass on Costs



Tie to Replacement of an Existing System



Dedicated Innovation Budget



MOST IMPORTANT FACTORS WHEN EVALUATING TECHNOLOGY

Ease of Use



Costs



Training and Support Available



Quantified ROI



MOST IMPORTANT FACTORS WHEN EVALUATING TECHNOLOGY

OUR RELATIONSHIP WITH INSURANCE CARRIERS IS MORE OF A PARTNERSHIP THAN A ONE-OFF TRANSACTION.



MY INSURANCE CARRIER UNDERSTANDS THE IMPORTANCE OF EMERGING TECHNOLOGY FOR PROJECT RISK.



MY INSURANCE CARRIER IS OPEN TO INTEGRATING EMERGING TECHNOLOGY INTO PROJECT RISK PRICING.



HOW ARE CONTRACTORS USING THE DATA

Doug Ware
VP of Risk Management



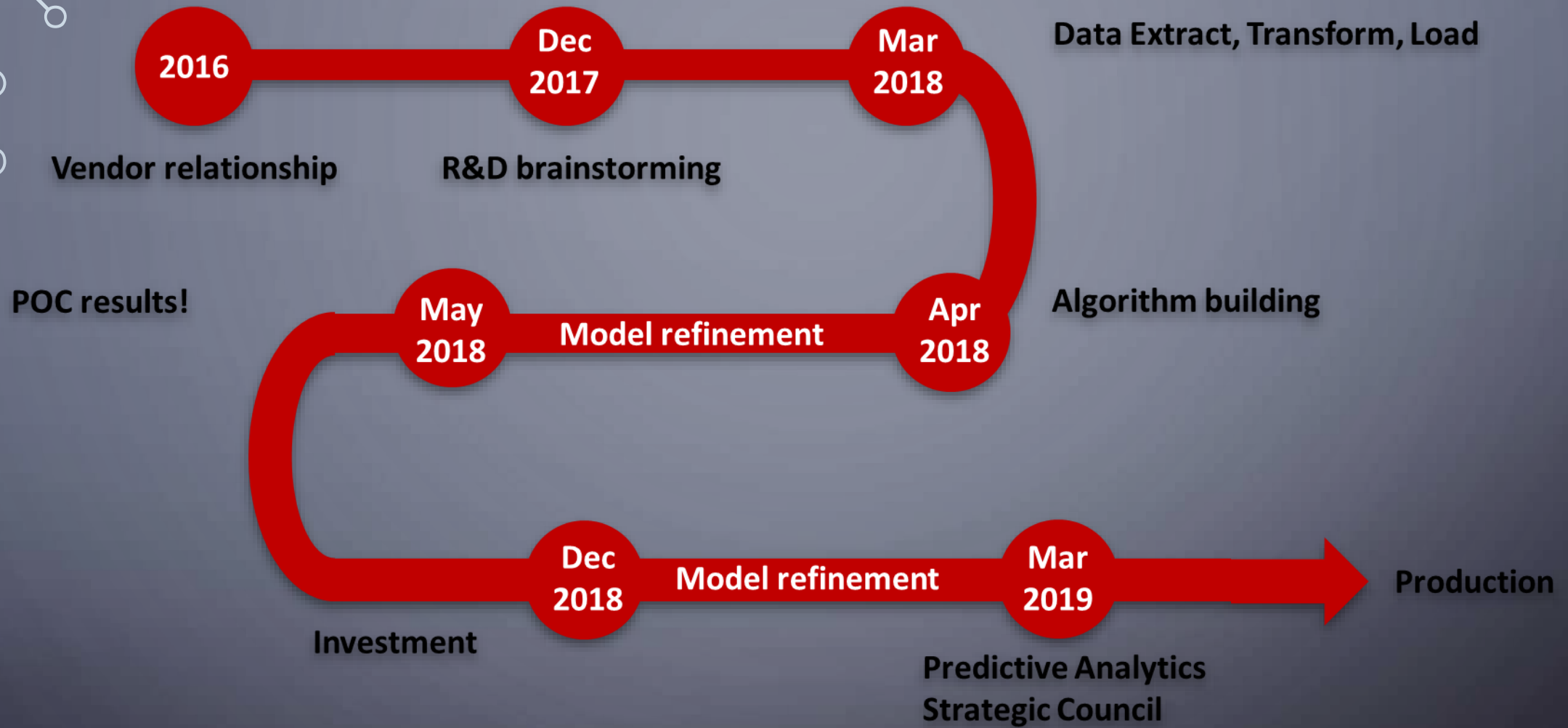
CASE STUDY

What is Predictive Analytics?

“A variety of statistical techniques from data mining, predictive modelling and machine learning, that analyze current and historical facts to make predictions about future or otherwise unknown events” Wikipedia

What is the Question/Challenge?

Predict the likelihood of an incident happening, using image recognition, and other data sources.



SUFFOLK'S JOURNEY

WHERE WE STARTED

700k+

images

360

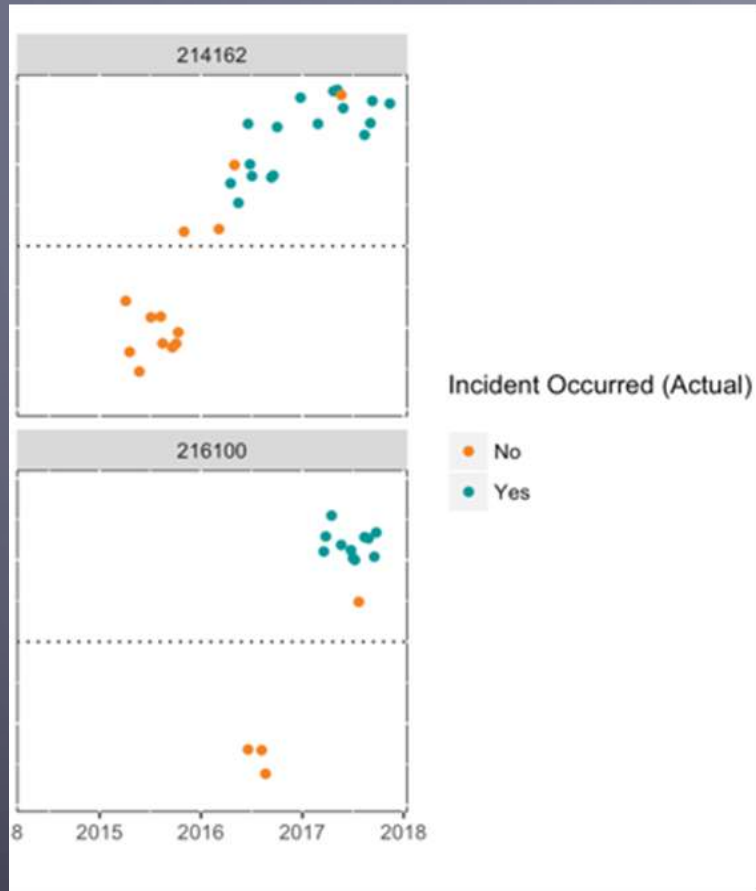
projects

10

years

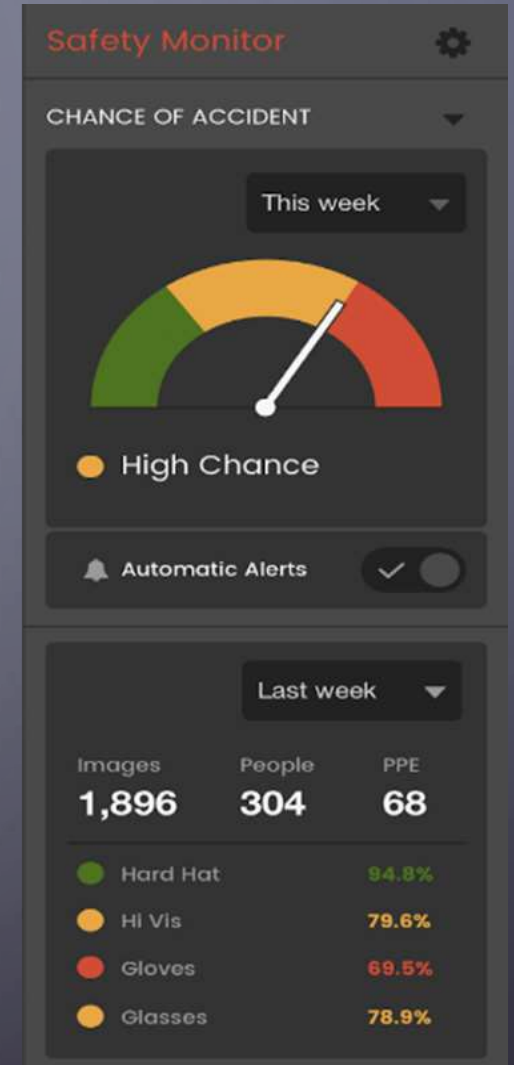


**Will an incident
occur in the next
week?**



Model
testing
results

User
interface
Mockup



PROOF OF CONCEPT

Select a Region:

Clearing the selection will restore the global view.



Historical Weighted Risk

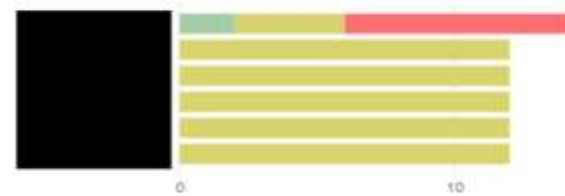
Weighted Risk Global Weighted Risk



Trade Partners with Highest Number of Observations



Trade Partners with Highest Weighted Risk



Observations Closed on Time

87%

Observations raised in the selected date range that were due before today and closed on time.

Weighted Risk by Hazard



Enter Date Range:

Last 6 Months
10/20/2018 - 4/19/2019

Observations to Include:

Great Catches Standard Observations

Statuses to Include:

Closed Open New

Select Identification Method:

Post Incident Action Other

Regional Overview

Region Breakdown

	Risk Observation	Positive Observation	Great Catches	Weighted Risk
SE-West	2955	1305	438	5.00
NE-Commercial	2037	1349	263	5.12
NE-Institutional	1235	2629	159	5.01
West-Socal	2298	1060	221	3.88
West-NoCal	1165	1439	170	3.75
Total	16246	11371	1892	4.40

Projects With Highest Weighted Risk

Project Number	Project Name	Risk Observation	Positive Observation	Great Catches	Weighted Risk
		1	0	0	8.00
		1	2	0	10.00
		20	32	1	8.80
		1	0	0	10.00
		1	0	0	8.00

Projects With Lowest Weighted Risk

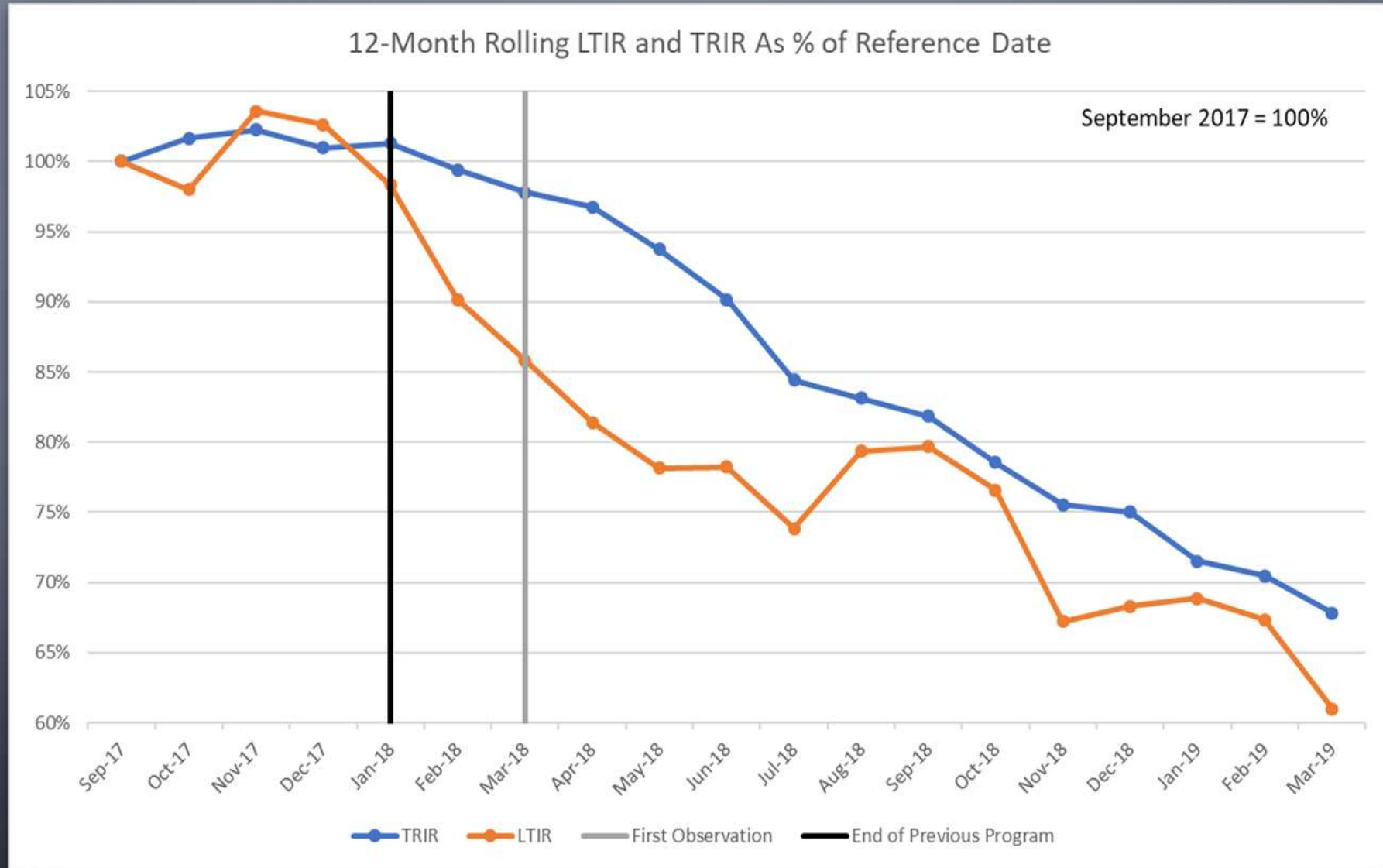
Project Number	Project Name	Risk Observation	Positive Observation	Great Catches	Weighted Risk
		0	6	0	0.00
		0	0	1	0.00
		0	1	0	0.00
		0	12	0	0.00
		0	9	3	0.00
		0	1	0	0.00

Risk Observations by Hazard



Date	Status	Project Name	Project Number	Identified By	Method Of Identification	Great Catch	Hazard Category	Risk Factor	Observation	Trade Partner	Required Action	Responsibility
04/15/2019	New		217039.0		Planned Maintenance	Standard Observations	Hand and Power Tools	0	good use of ppe when cutting old restraint		good protection	
04/14/2019	New		217111.0		Routine Inspection	Standard Observations	Walking and Working Surfaces	2	clearly mark tripping hazard and direct foot traffic away from		clearly identify and re-direct foot traffic	

THE RESULTS



SUFFOLK

Mortenson
construction

SKANSKA

Messer
WeAreBuilding.

SHAWMUT
Design and Construction

PREDICTIVE ANALYTICS STRATEGIC COUNCIL



SMARTVID.IO

DPR
CONSTRUCTION

Barton
Malow

BOUYGUES

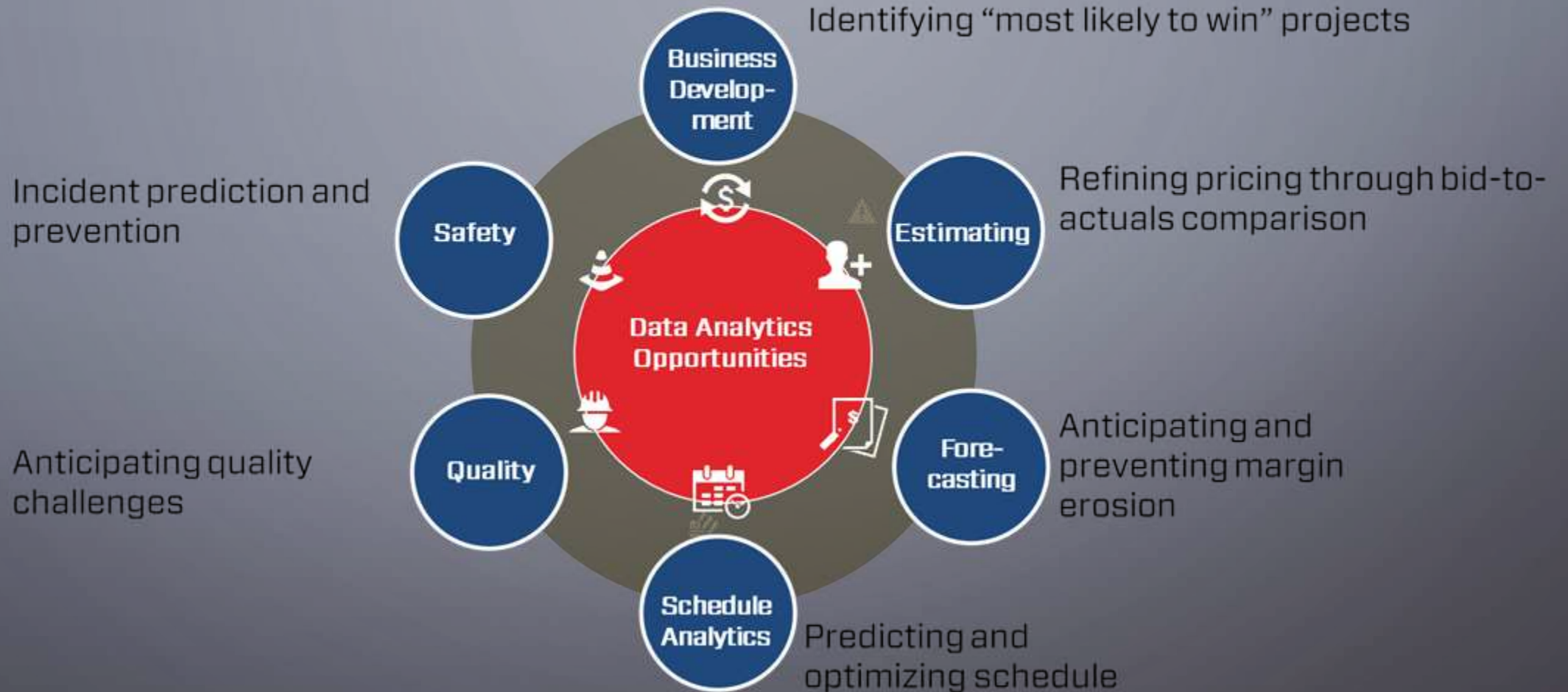
Lithko
CONTRACTING, INC.

AOW

JE DUNN

*To learn and explore by doing;
To build new models for areas of risk;
To understand the operational, social and business impacts;
To chart course through obstacles and bring the benefits of predictive analytics to the AEC industry*

Data Analytics in Construction: No shortage of opportunities across the project lifecycle





PROJECT MANAGEMENT DASHBOARD - SELECT PROJECT TO CONTINUE

PROCORE

Filters

PROJECT FILTER

- ☐ 214162 - All Aboard - Station
- ☐ 214170 - Prive at Island Estates
- ☐ 215028 - One Dalton
- ☐ 215137 - The Bristol
- ☐ 215181 - Met Square Podium (7-8)
- ☐ 216011 - Met Square Tower (Level 9+)
- ☐ 216040 - LUMA(MWC)-Tower 4
- ☐ 216048 - Ritz-Carlton Residences
- ☐ 216057 - APS - Sitework
- ☐ 216067 - Station Park Green
- ☐ 216084 - 888 Grand Hope Lofts
- ☐ 216086 - Rolling Hills Country Club
- ☐ 216088 - APS - MOB
- ☐ 216098 - Wynn - Hotel Tower

FEEDBACK:



Target	Green Target	Region
GC Variance	-250,000.00	
GR Variance	-250,000.00	
Avg TCO Variance	-7.00	
Latest Cash Balance	0.00	
MoM TCO Variance	0.00	
Profit Variance %	0.00	
TRIR	0.00	Corporate
TRIR	0.81	Southern

SAFETY

12 MONTH ROLLING TRIR

0.00

Green Target: 0.81
Red Target: 1.02

12 MONTH ROLLING LTIR

0.00

Green Target: 0.81
Red Target: 1.02

LABOR TRACKING

125

Avg. M-F Head ct.

403

Peak Headcount

0.0%

Daily Log Completion

EMPLOYEE ENGAGEMENT

0

Current eSat

0

eSat Change from Prior

Current Survey: 3/1/2019 Prior Survey: 3/1/2019

REQUIRED LEARNING

0%

Completed %

CONSTRUCTION ADMIN

SUBMITTALS

0

Open Submittals

0

Overdue Submittals

0.00

Avg. Open Due Date Var...

RFIs

0

Open RFIs

0

Overdue RFIs

0.00

Avg. Open RFI Due Date...

SCHEDULE

Avg. TCO Variance By Monthly Update

Monthly Data Variance Schedule Target

0.00

0.00

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PLAN + CONTROL

Plan + Control Data Acquisition
Being Revised

FINANCIALS

\$0.0M

Original CV(\$)

\$0.0M

Curr. Forecast CV(\$)

\$16,07...

ECAC

0.0%

Cost % Complete

0.00%

Original Gross Profit %

0.00%

Current Gross Profit %

0.00%

Gross Profit Variance %

GC's | GR's

GENERAL CONDITIONS

\$0.0M

GC Budget

\$0.0M

GC ECAC

\$0

GC Variance

0.0%

GC % Burned

GENERAL REQUIREMENTS

\$0.0M

GR Budget

\$0.0M

GR ECAC

\$0

GR Variance

0.0%

GR % Burned

CHANGE MANAGEMENT

PCOs

\$0.00

Total Open PCOs (\$)

\$0.00

\$ Amount Over 90 Days

0

Total Open PCO Count

0

Open PCOs over 90

CHANGE EVENTS

IN SCOPE

OUT OF SCOPE

TBD

\$0.00

\$ In-Scope

\$0.00

\$ Out of Scope

\$0.00

\$ TBD

0

In-Scope

0

Out of Scope

0

TBD

ALLOWANCES | CONTINGENCY | HOLDS

\$0

Allowances

\$0

Contingencies

\$0

Holds

0.0%

Allowance % Burned

0.0%

Contingency % Burned

0.0%

Hold % Burned

BUYOUT

\$0.00

Total Trade Buyout

\$0.00

Remaining Trade Buyout

0%

Buyout % Complete

Project Summary

Budget

Buyout Status

Change Management

Required Learning

Safety Metrics

Submittals & RFIs

Trade Partner Tracking

Data Definitions/Targets

Show all

AGGREGATING AND HUMANIZING

Rose Hoyle

Strategic Operations for
Risk Engineering



THE CONTRACTOR'S DILEMMA

How do I
translate data
into insights?

Will it
scale?

Which tech is right
for my business?

How do I
manage all the
platforms?

What's
the ROI?

How much
does it cost?

Can tech
reduce risk?

Can tech
increase
profitability?



AXA XL'S RESPONSE

- Skin in the Game
- Doing the Legwork
- Data Through Partnerships
- Ecosystem Platform
- Trending and Benchmarking
- The Human Element: Data Analytics + Risk Engineering = Risk Analytics

WHAT IS AN ECOSYSTEM?

An Ecosystem is an **integrated, digital experience**, providing an **interconnected set of services & products** which enables AXA XL & our customers to **partner**, unlocking & connecting unique **insights and opportunities to manage risk**.

AXA XL ECOSYSTEM



Risk Dashboard



Tailored Risk Analytics Services



Tailored Claims Services



Tailored Form/Coverages



Benchmarking



Predictive Risk Indicators



Reduce the Cost of Risk



Better Risk Selection

