### **Digital Trust:** Unleashing Construction's TechnoRevolution







### **Meet the Speaker**





### Chief Product Officer Rich Humphrey, Contruent

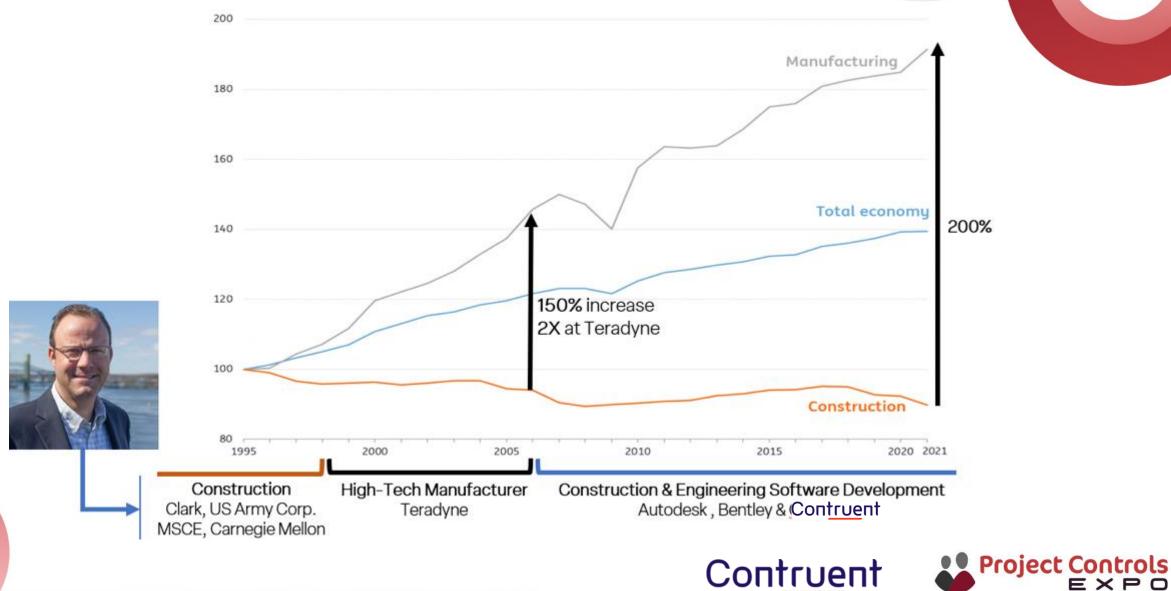
**Construction and Engineering Software Development** 

**Hi-Tech Manufacturing Product Development** 

**Construction Project Management, Civil Engineering** 



### **Meet the Speaker**



London, UK

### **About Contruent**





### We Have a Problem!



On average, projects have a 27% cost over-run





Only 55% of projects are delivered on time and on budget



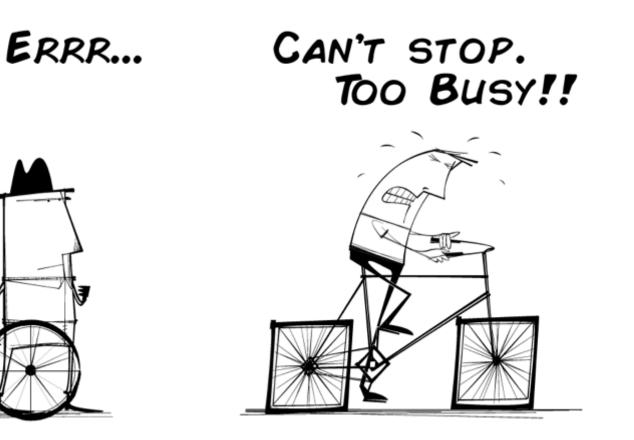


Projects are 3.8x more likely to fail without full integration of systems and processes





### **Too Busy to Improve?**



Contruent Project Controls



### Use the Best Tools to Do the Job



We will need to ensure we are leveraging the best technology to do the job.





### **Demand for Infrastructure**





The recent trillion-dollar infrastructure bill will help drive new projects in the US to satisfy demand.



## **Project Complexity**



### **Increasing Requirements:**

- Transparency
- Sustainability
- Health and safety
- Quality controls
- Design complexity
- Project size
- Faster, lower cost



### **Resource scarcity is increasing including:**

- A lack of skilled labor and inability to attract new talent
- Higher material costs and supply chain issues
- Large capital equipment utilization

### **Future of Work**



Covid has accelerated the need to accommodate remote work collaboration.





### **Data Transparency and Trust**





**30% 90% 4%** Data Not Data Silos Structured Utilization



Current State of Digital Trust Trust equals better collaboration and productivity.

### **Current State of Digital Trust**

	Data Capture	<b>Data Management</b> Controls, Workflows & Collaboration	<b>Data Decisions</b> Reporting & Analysis		
Low Trust Unstructured Unconnected	Paper	Paper	Excel		
Low quality Not timely	Excel	Excel	Reports		
	Web/Mobile Forms	Silo's Systems	Static Dashboards		
Structured Connected High quality Real-time	Reality Capture	CDEs	Data Analysis & Bl		
High Trust	IoT/Sensors	Connected CDE via Open APIs	AI/ML Decision Support		





#### Paper & Excel Desktop Apps

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#### Low Trust

Unstructured Unconnected Low quality Not timely

#### Cloud-based Web & Mobile Apps



#### Reality Capture & IoT/Sensors



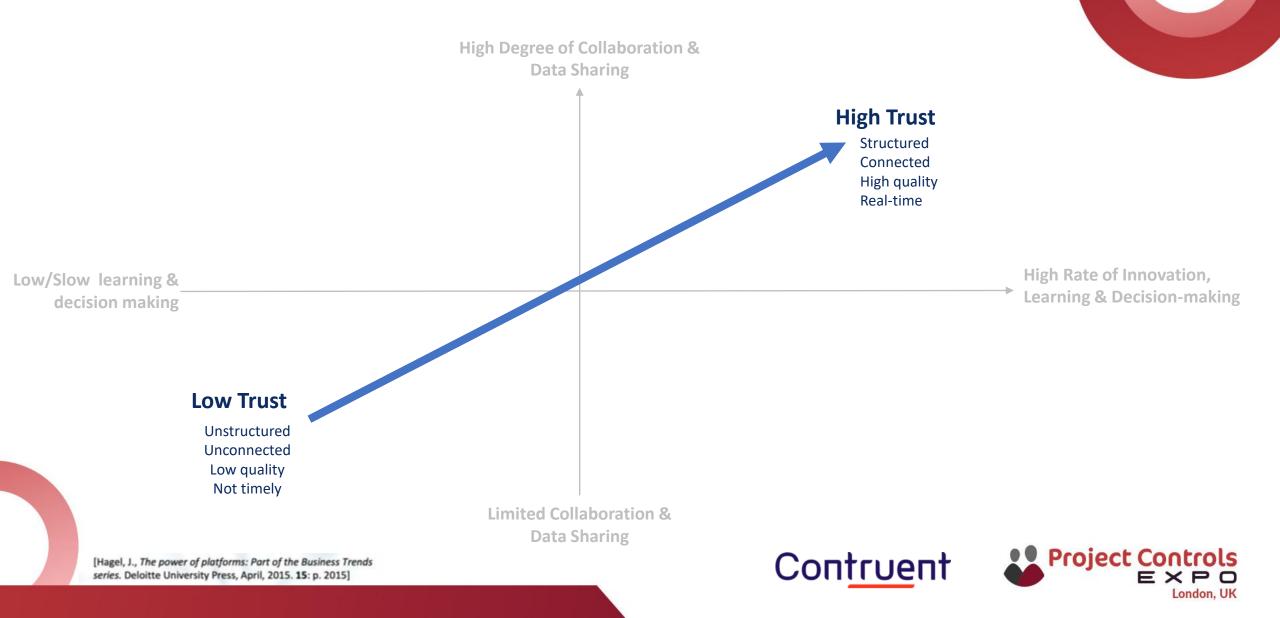


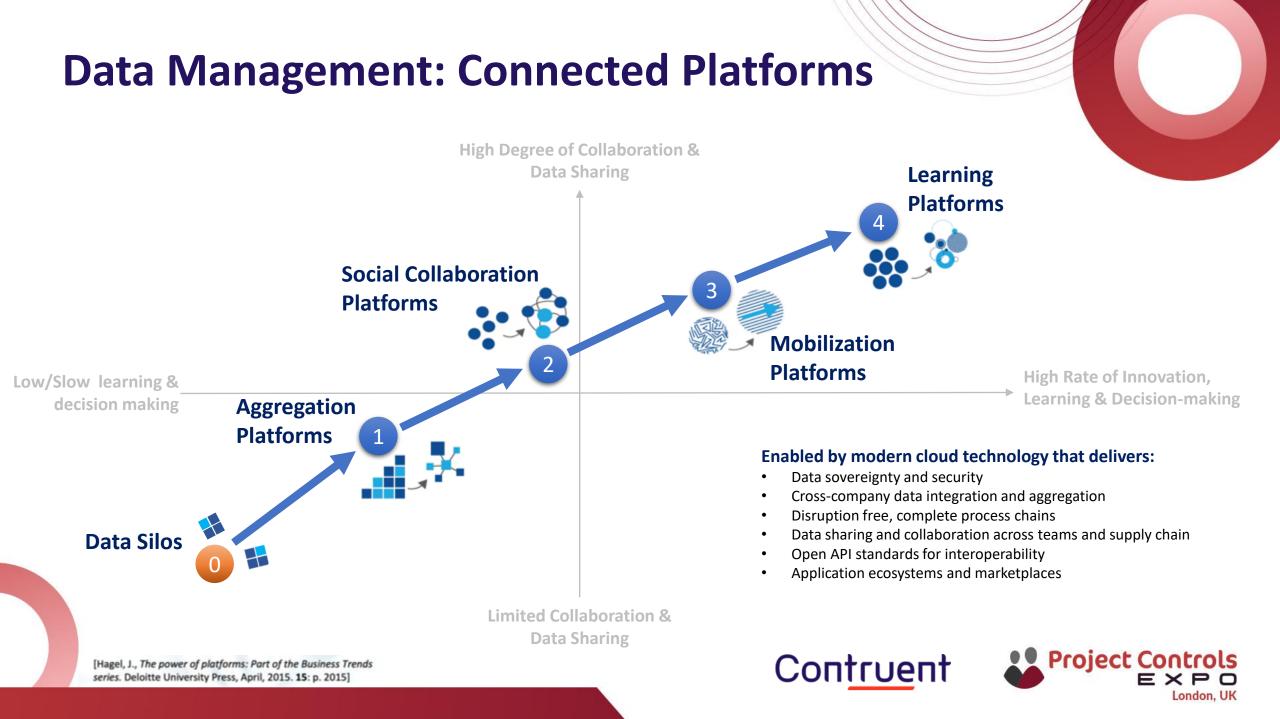
High Trust

Structured Connected High quality Real-time



### **Data Management: Connected Platforms**





### **Data Decisions**

#### Low Trust

#### Unstructured Unconnected Low quality

Not timely

#### Siloed Excel & PDF Reports

	onstruction	on Sche	edule	Templa	te									
Project Name:	Str	rart Date:		Total Duratio	n:									
Project Manager:	En	d Date:												
TASK DESCRIPTION	STATUS AS	SIGNED 1 ST	ART DATE	END DATE	DURATION	COMMENTS								
Planning	Complete	9	/21/2025	9/30/2025	10									
Raw Material Accumulatio	Complete	1	0/1/2025	10/6/2025	6									
Basement Creation	Complete	3	0/6/2025	10/24/2025	19									
Floors Creation	Complete	10	1/25/2025	10/29/2025	5									
Light Fittings	Complete		1/1/2025	11/13/2025	13									
Sewage Pipelines	Complete		1/13/2025	11/15/2025	3									
Painting	In Progress		0/25/2025	12/5/2025	20									_
Accessories Installation	In Progress	11	1/19/2025	12/10/2025	22									
AC Installation	In Progress	10	1/29/2025	12/9/2025	5									
Fire Extingushers	In Progress	11	1/22/2025	12/15/2025	24									
Parking Space	Not Started	17	1/29/2025	12/20/2025	22									
Appliances	On Hold			12/22/2025	13									
Plumbing	In Progress	12	2/10/2025	TABLEATION	1		_	_						
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#### Dynamic Dashboards and AI/ML assisted BI





High Trust Structured Connected High quality Real-time

## **Construction Technology Evolution**

#### 2D

80% Adoption

Desktop

Early adoption of desktop-based scheduling, estimating and financial ERP

2.5D- 3D

50% Adoption

Web & Cloud

Then added desktop and web-based project and document management software

2000s

#### 3D/BIM/VDC

25% Adoption

Mobile

Smart phones and drones open automation to field management data capture and access

2010s

#### 4D/5D Digital Twin

5% Adoption

### Insights

Cloud computing, IoT, Business Intelligence (BI) and AI/ML

2020s

**Project Controls** 

London, UK

1990s

Adoption is lagging technology evolution. Technology leadership is not equal to market leadership.



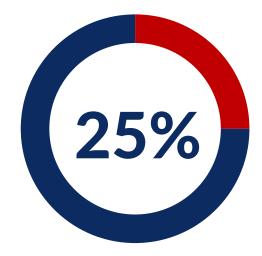
### The Construction Industry Has Been Slow to Digitize





57% of firms spend less than 2% of total revenue on IT and software. The construction industry spends half as much on IT compared to the global industry average.

50%



Of firms have a digital software strategy.

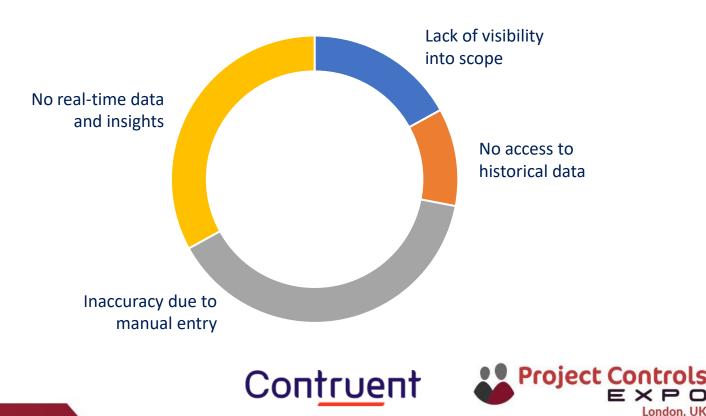


CONSTRUCTION SOFTWARE OVERVIEW Raymond James Technology & Service, June 2022

### **Obstacles to Building Digital Trust**

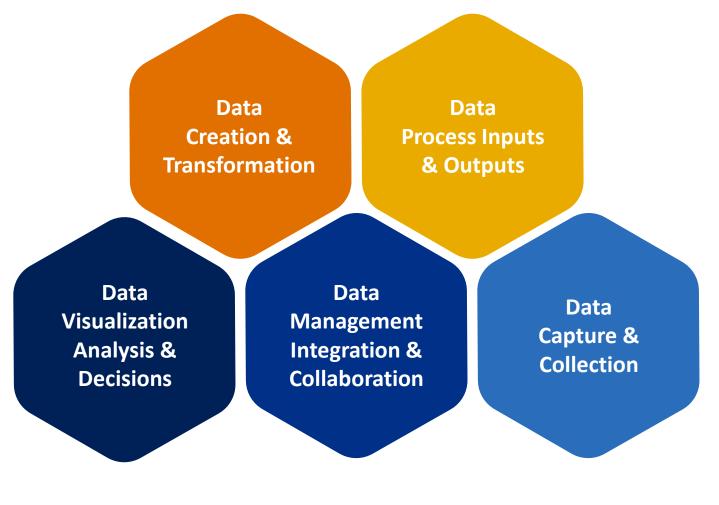
- Lack of Investment
- Black box and auto calculations
- Fear of the unknown (AI/ML)
- Data quality, verification
- Data lag and timing of data
- Volume of Data
- Security of Data

Which of the following challenges have you experienced the most with traditional project controls software?



### How Do We Build Trust Going Digital?

### **Develop the Building Blocks of Digital Trust**





Contruent

### **Data Trust and Project Controls Process**

#### Leveraging a **Project Controls CDE** to manage inputs and outcomes including:

Establish Cost	Cost Data Capture &	Data	Data	Data Analysis
Baseline	Collaboration	Processing	Integration	& Decisions
<ul> <li>Project templates</li> <li>Cost and schedule inputs</li> <li>WBS, CBS, OBS</li> </ul>	<ul> <li>Field progress and events</li> <li>Cost change management</li> <li>Contract management</li> <li>claims / invoices</li> <li>Supply chain management</li> </ul>	<ul> <li>Earned value</li> <li>Budget forecasts</li> <li>TPD updates, etc.</li> </ul>	<ul> <li>ERP/MRP</li> <li>Cost controls</li> <li>Schedule</li> <li>Estimating, etc.</li> </ul>	<ul> <li>Dashboards</li> <li>Reports</li> <li>Business intelligence</li> <li>Data visualization</li> </ul>

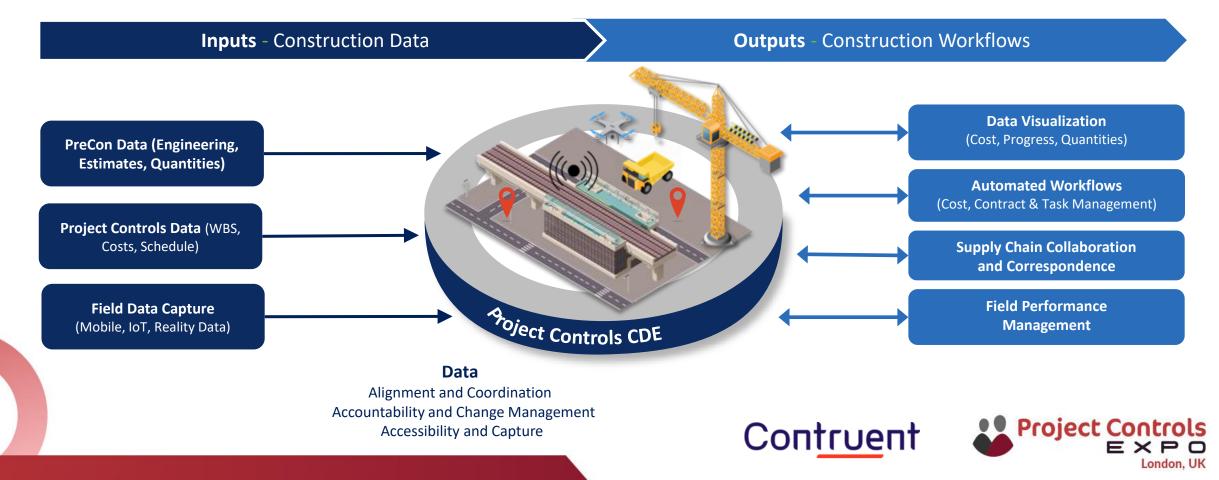


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### **Data Trust and Project Controls**



Transform Project Controls and Program Management and deliver better, more predictable project outcomes.

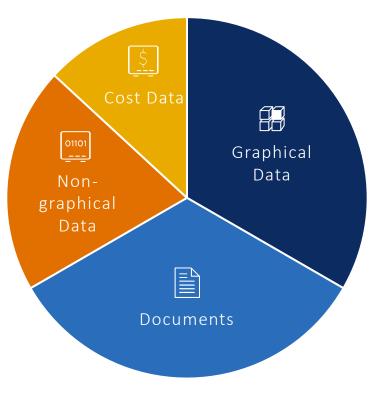


### **Common Data Environment**

#### **Project Controls CDE: Cost and Schedule**

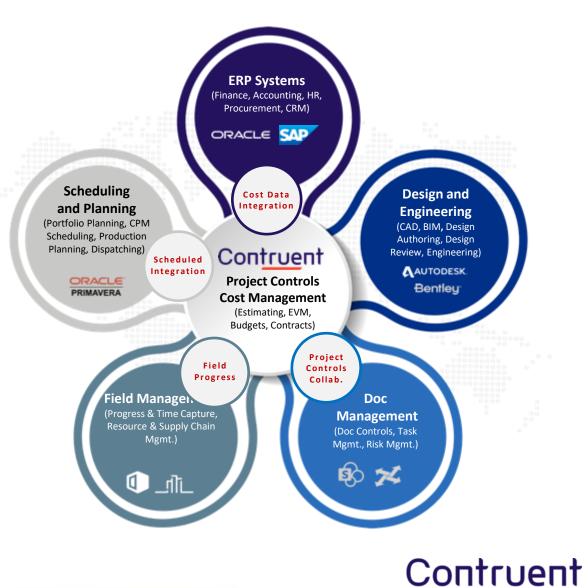
- Single source of truth
- Connects all data types around the project
- Data access and capture procedures
- Workflows enabled on top of CDE
- Data security

#### **Common Data Environment**





### **Connected Data Environment**





### Data Capture In Realtime

- Mobile apps and devices
- Reality capture
- IoT—sensors

## **Collaborative Workflows**

- Automated workflows
- Repeatable templates & procedures
- Structured data
- Connected data and resources
- Cloud-based coordination

120 Available Available Contract (1990) 1997			
* Change Order Sumn	sary - 0005-0005		Approved O Rejected
Change Information		Status Details	
Project ID	PROJECT A - Sample	Status	SUBMITTED -
	Project A	Status Date	
Change ID	0005-0005		× Not Final
Description	scope update		
Details	This change is regarding		
	a scope update in the		
	concrete pouring volume.		
	The revised amounts		
	have been reflected in		
	this change order		
Comments			

Approvers receive email notifications and can utilize mobile devices to make decisions

Advanced change management with workflows for an in-program user notification, action items, review and approval





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# **Collaborative Workflows**

### **Supply Chain Coordination**

#### Contractor Portal provides visibility into the progression of contractor claims, allowing you to track progress

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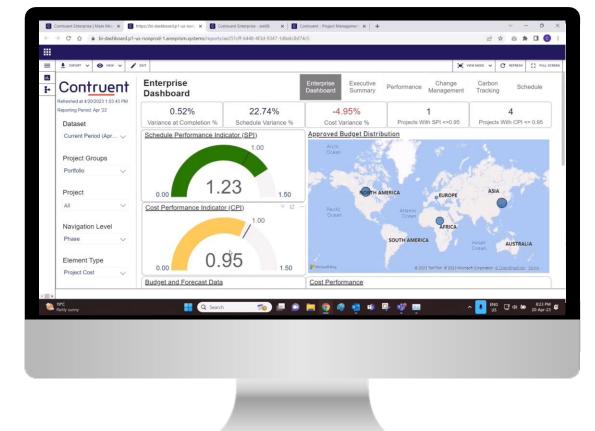
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Contractor Portal	
Contract Progress Claims View and Submit Contract Progress Claims	
Cost Progress Claims View and Submit Cost Progress Claims	0
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#### Gated contractor access for data viewing, template downloads and uploads



## **Data Visualization, Analysis & Decisions**

- Dashboarding and reports
- <u>Business analytics/</u> intelligence
- BIM 3D/4D/5D and digital twins
- AR/VR
- AI/ML

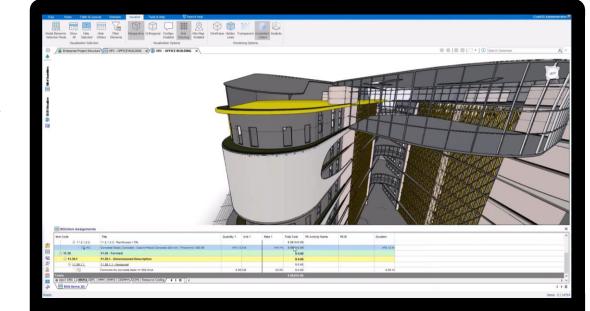


With enterprise dashboards that show key performance indicators and allows users to easily drill down into problem areas.



## **Data Visualization, Analysis & Decisions**

- Dashboarding and reports
- <u>Business analytics/</u> intelligence
- BIM 3D/4D/5D and digital twins
- <u>AR/VR</u>
- <u>AI/ML</u>



With model-based 3D/5D environments, data can be interrogated and analyzed in a more immersive experience reducing errors and omissions.



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## **Project Controls Data Trust Summary**

#### How to build trust, increase collaboration and improve productivity:

- Capture real-time, structured quality data capture with mobile, reality capture and IoT
- Break down data silos with open platforms and common data environments
- Make data more accessible to more team members (share) with cloud/web-based collaboration software
- Make better sense of your data with purpose-built solutions that put data to work
- Make data more visible with data analysis, dashboards and reports so you can better, faster decisions

#### What will be the outcomes of data trust?

- **Productivity:** Teams will be more efficient/productive as they have access to the data. They need to do their work; they can more easily coordinate with others; and they can respond quicker to events and issues
- **Risk and Dispute Management:** Resolve disputes and avoid issues as there is more access to the same data (i.e., events, project schedule, costs, material quantities/progress)
- Project Controls: Keep projects in control as near-real time access to higher quality data for cost and schedule



### CONTRUENT

The capital project controls software that's project-ready right out-of-the-box to drive project performance.



### Built by Project Controls Experts for Project Controls Professionals



Purpose-built by expert, experienced practitioners who do what you do



Over 25 years of best practices and intellectual property programmed in Intuitive workflows get more of your team involved sooner and more easily



Harmonize data between and across projects to facilitate better decision-making

### To ensure your projects stay on time and on budget



#### **Best-in-Class Project Controls Solution**



**Cost Management Optimize Project Spend** & Performance

**Change Management** Account for Change & Maximize Efficiency



**Data Insights** Improve Visibility to Make Informed Decisions

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**Contract Management** Manage Contracts & Contractor Activity

#### **Project Controls Add-Ons**

**Engineering, Procurement & Field Management** Extended Project & Portfolio Visibility

Integrator Control Project Spend End-to-End

**Estimator** Set Budgets with Quantity Take-off & Estimating



### **Faster to Achieve Your Desired Business Outcomes**

Optimize Project Spend & Performance	Improve Visibility to Make Informed Decisions	Manage Change & Maximize Efficiency	Manage Contracts & Contractor Activity
2%	80%	4%	1%
Reduction of annual spending due to better forecasting and fewer overruns	Reduction of time spent on data collection, entry and validation	Reduction of contract overspending due to improper change management	Reduction of contact spend with better data quality and reliable reporting
Common Data Environment	Data Visualization	Automated Workflows	Supply Chain Collaboration
	Visualization	Workflows	



Contruent

Comprehensive Cost Controls Solution for Owners/EPCMs

#### Deliver Fastest Time-to-Value

Connect Teams that Own Project/Program Costs and Budget



- Delivers a project controls common data environment for projects/programs and the enterprise
- Deep, lifecycle solution that connects estimating, costs, contracts and field performance
- Project and portfolio data insights and intelligent decision support

- Easy to deploy and scale with modern SaaS platform
- Easy to use/learn with modern web/mobile user experience
- Self admin and automations
- Open data access with APIs and integrations to connect costs controls to other critical systems



- Keeping everyone on the same page—cost controls collaboration connecting teams and supply chain
- Understand status, forecast and how to get there with quick data access, forecasting (time phasing) and task management
- Best-in-class change management
- Real-time data access to make faster better decisions



# THANK YOU

