

Digital Trust:

Unleashing Construction's TechnoRevolution



Contruent

 **Project Controls**
EXPO
London, UK

Meet the Speaker



Chief Product Officer
Rich Humphrey, Contruent

Construction and Engineering Software Development

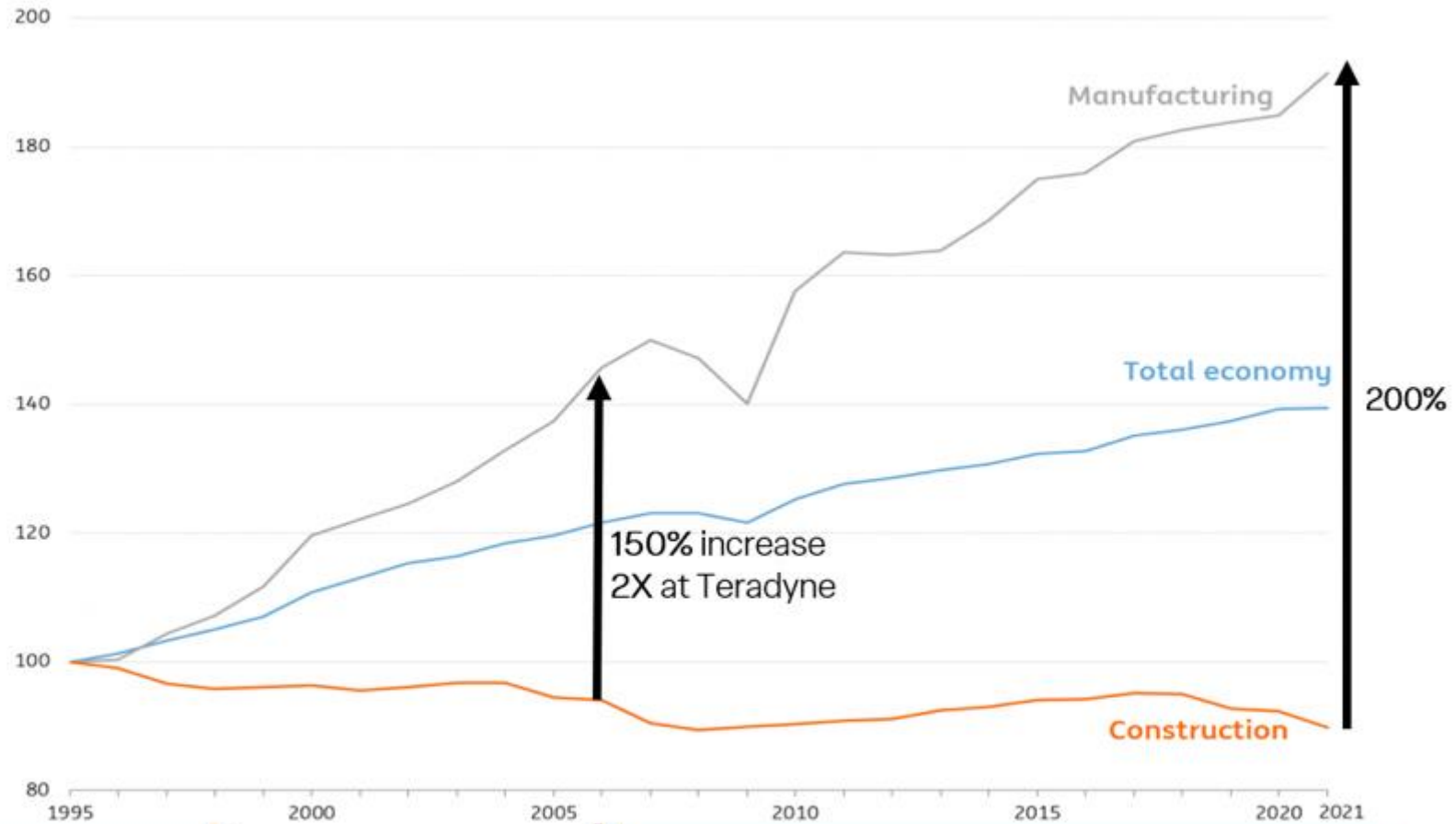
Hi-Tech Manufacturing Product Development

Construction Project Management, Civil Engineering

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Meet the Speaker



Construction
Clark, US Army Corp.
MSCE, Carnegie Mellon

High-Tech Manufacturer
Teradyne

Construction & Engineering Software Development
Autodesk, Bentley & Contruent

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About Contruent



Our Mission

Empowering decision-makers to build our world's infrastructure with precision and speed.



Con·tru·ent

Derived from 'construction' + 'true' + '-ent' (performing, promoting, or causing a specific action)



Origin

1990s: Began as ARES PRISM, project controls software.

We Have a Problem!

27%

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



55%

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



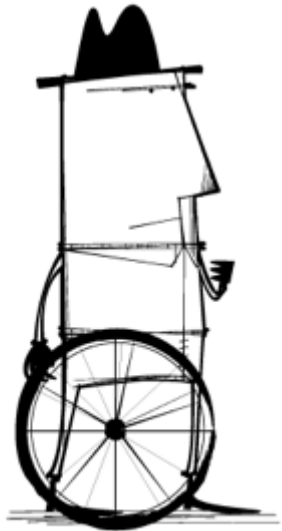
3.8x

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



Too Busy to Improve?

ERRR...



**CAN'T STOP.
TOO BUSY!!**



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%

Data
Silos

90%

Not
Structured

4%

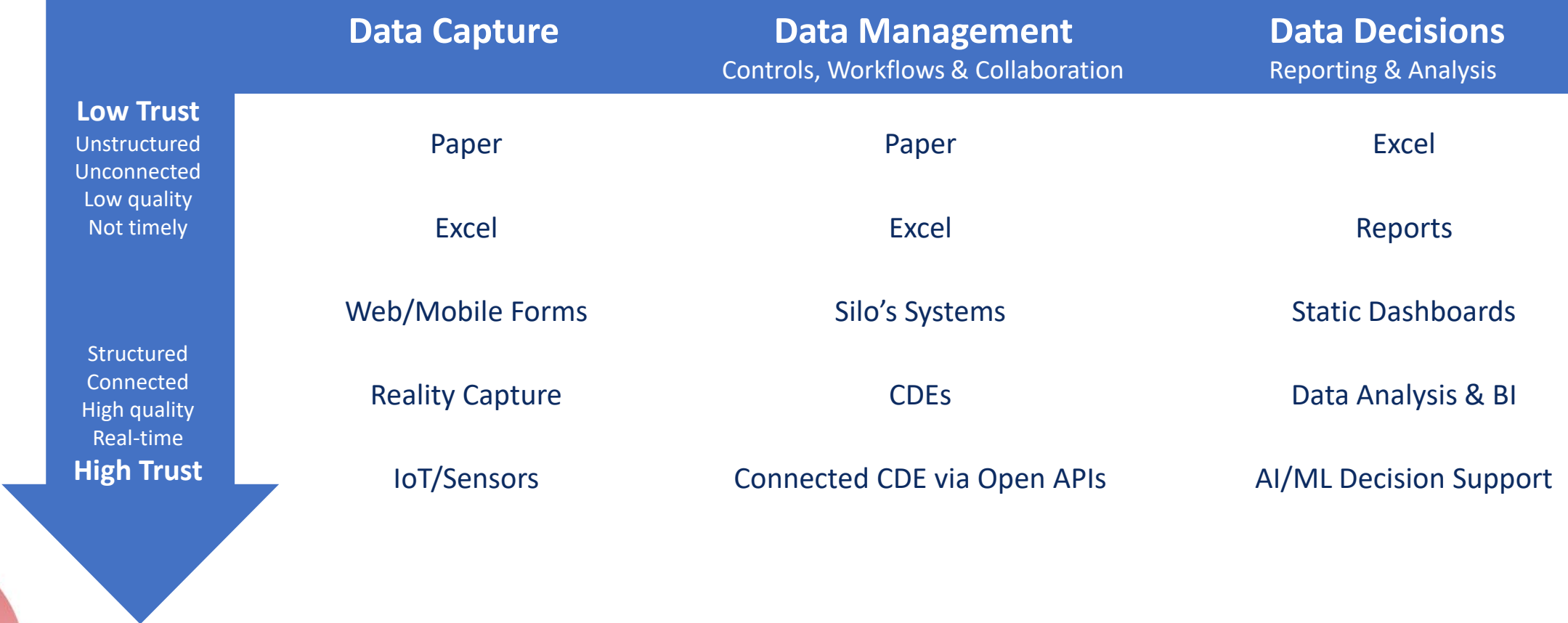
Data
Utilization



Current State of Digital Trust

Trust equals better
collaboration and
productivity.

Current State of Digital Trust



Data Capture

Paper & Excel Desktop Apps

Project Name	Contract Value	Capacity	Team	Serial Number
Part 1 Item	Unit Engineering Quantity	Unit price	Amount (Quat)	Remark
1000	100	1000	100000	
2000	200	2000	200000	



Cloud-based Web & Mobile Apps



Reality Capture & IoT/Sensors



Low Trust

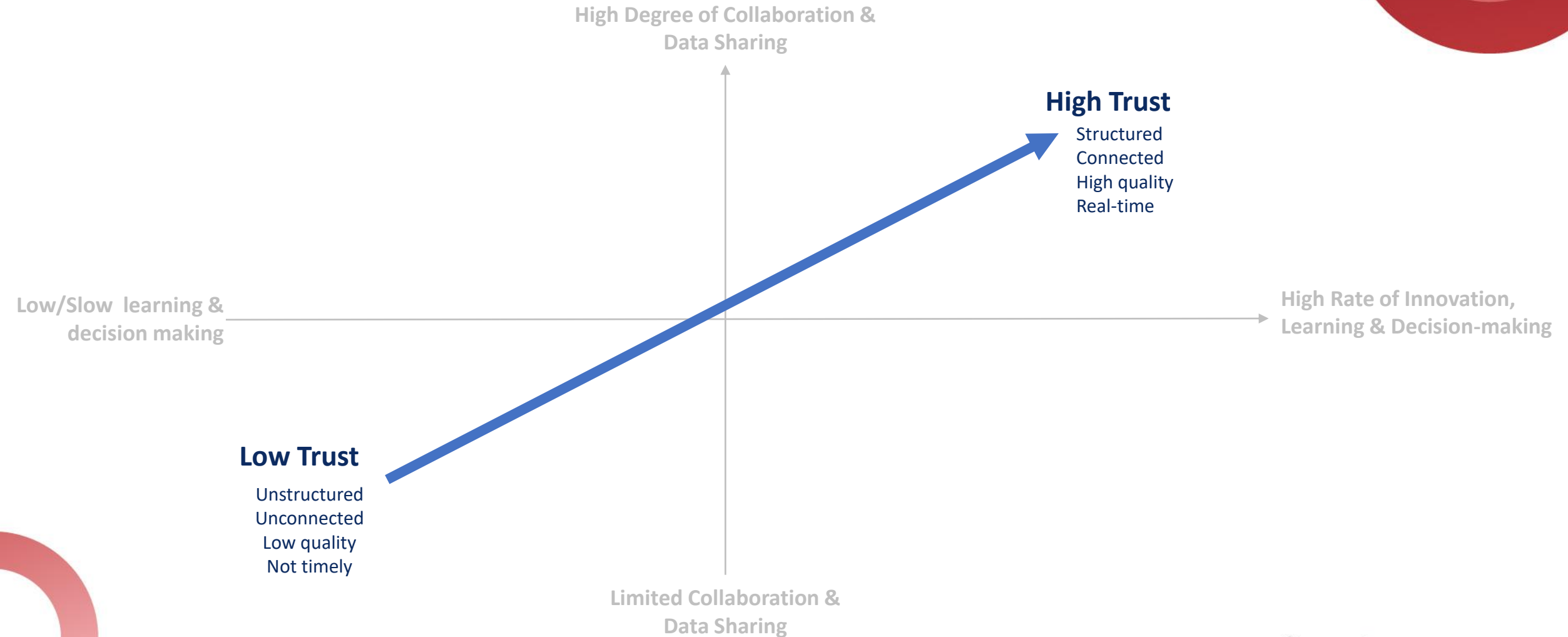
- Unstructured
- Unconnected
- Low quality
- Not timely

High Trust

- Structured
- Connected
- High quality
- Real-time



Data Management: Connected Platforms

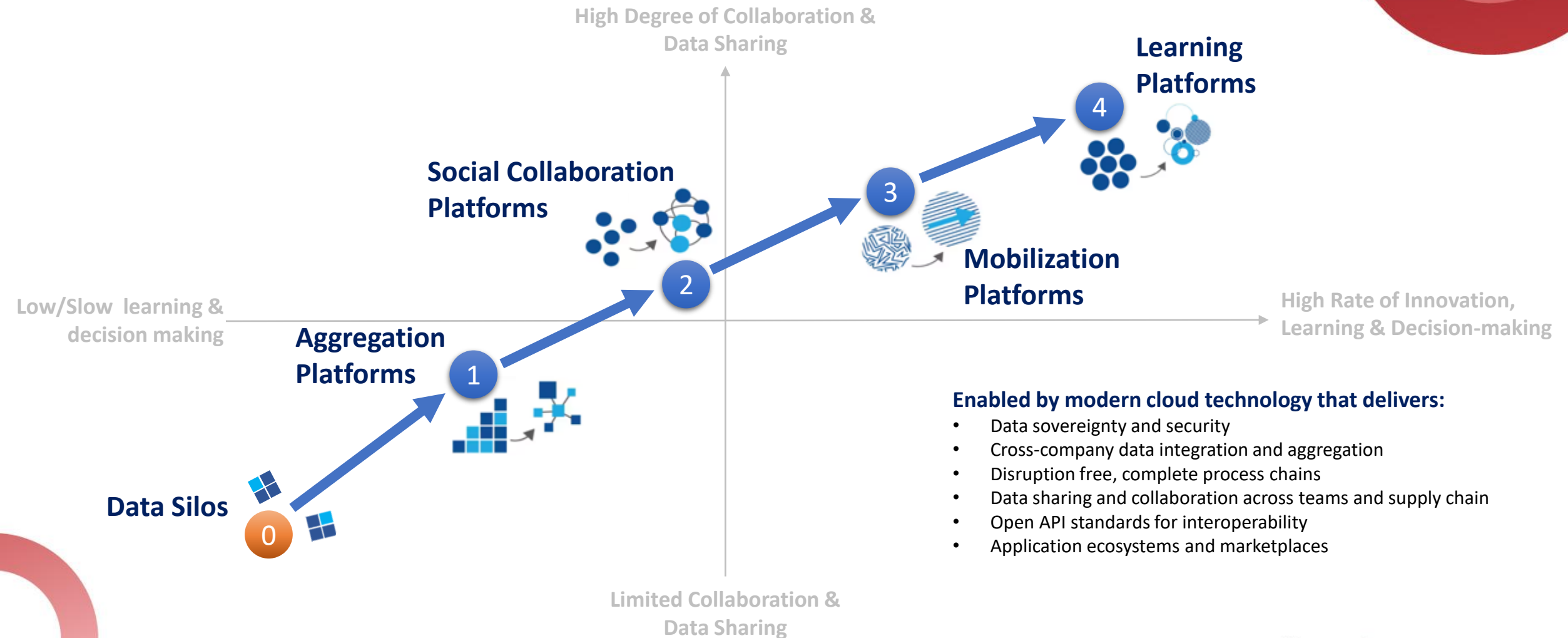


[Hagel, J., *The power of platforms: Part of the Business Trends series*. Deloitte University Press, April, 2015. 15: p. 2015]

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Data Management: Connected Platforms



Enabled by modern cloud technology that delivers:

- Data sovereignty and security
- Cross-company data integration and aggregation
- Disruption free, complete process chains
- Data sharing and collaboration across teams and supply chain
- Open API standards for interoperability
- Application ecosystems and marketplaces

Data Decisions

Low Trust

Unstructured
Unconnected
Low quality
Not timely

High Trust

Structured
Connected
High quality
Real-time

Siloed Excel & PDF Reports

Construction Schedule Template						
Project Name:	Start Date:	Total Duration:				
Project Manager:	End Date:					
TASK DESCRIPTION	STATUS	ASSIGNED	START DATE	END DATE	DURATION	COMMENTS
Planning	Complete		9/21/2025	9/30/2025	10	
Raw Material Accumulation	Complete		10/1/2025	10/6/2025	6	
Basement Creation	Complete		10/6/2025	10/24/2025	19	
Floors Creation	Complete		10/25/2025	10/29/2025	5	
Light Fittings	Complete		11/1/2025	11/13/2025	13	
Sewage Pipelines	Complete		11/13/2025	11/15/2025	3	
Painting	In Progress		10/25/2025	12/5/2025	20	
Accessories Installation	In Progress		11/19/2025	12/10/2025	22	
AC Installation	In Progress		10/29/2025	12/9/2025	5	
Fire Extinguishers	In Progress		11/22/2025	12/15/2025	24	
Parking Space	Not Started		11/29/2025	12/20/2025	22	
Appliances	On Hold		12/10/2025	12/22/2025	13	
Plumbing	In Progress		12/10/2025	12/22/2025	13	
Final Inspections	Not Started		12/22/2025	12/22/2025	1	
Wrap up	Not Started		12/3/2025	12/3/2025	1	
House Cleaning	Not Started		1/3/2026	1/3/2026	1	
Complete	Not Started		1/3/2026	1/3/2026	1	

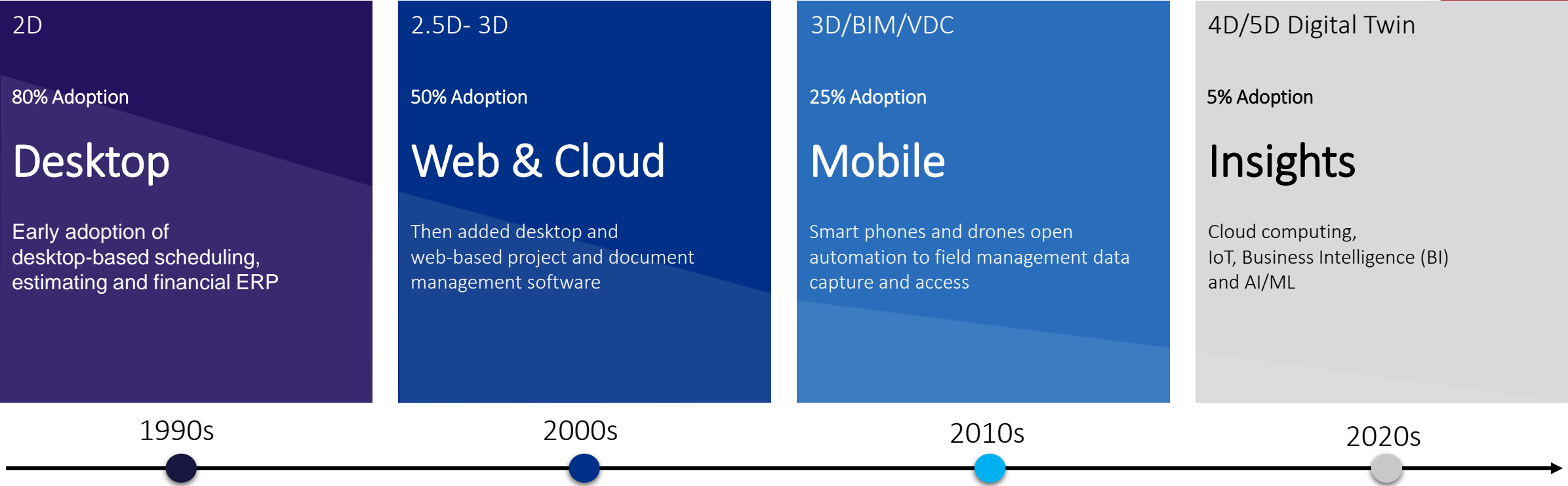


BID TABULATION											
			Contractor A		Contractor B						
Item #	Item Description	Qty	UNIT	PRICE	UNIT	PRICE					
1	Concrete	1	CU	100.00	1	100.00					
2	Reinforcement	1	LB	200.00	1	200.00					
3	Formwork	1	SQ	500.00	1	500.00					
4	Foundation Excavation	1	CU	100.00	1	100.00					
5	Foundation Concrete	1	CU	200.00	1	200.00					
6	Foundation Reinforcement	1	LB	400.00	1	400.00					
7	Columns	1	CU	50.00	1	50.00					
8	Beams	1	CU	100.00	1	100.00					
9	Floors	1	CU	200.00	1	200.00					
10	Walls	1	CU	300.00	1	300.00					
11	Roofs	1	CU	400.00	1	400.00					
12	Stairs	1	CU	500.00	1	500.00					
13	Partitions	1	CU	600.00	1	600.00					
14	Windows	1	CU	700.00	1	700.00					
15	Doors	1	CU	800.00	1	800.00					
16	Interior Finishes	1	CU	900.00	1	900.00					
17	Exterior Finishes	1	CU	1000.00	1	1000.00					
18	Site Work	1	CU	1100.00	1	1100.00					
19	Utilities	1	CU	1200.00	1	1200.00					
20	Landscaping	1	CU	1300.00	1	1300.00					
21	Security	1	CU	1400.00	1	1400.00					
22	Signage	1	CU	1500.00	1	1500.00					
23	Permitting	1	CU	1600.00	1	1600.00					
24	Insurance	1	CU	1700.00	1	1700.00					
25	Professional Fees	1	CU	1800.00	1	1800.00					
26	Contingency	1	CU	1900.00	1	1900.00					
27	Subtotal	1	CU	10000.00	1	10000.00					
28	Tax	1	CU	200.00	1	200.00					
29	Grand Total	1	CU	10200.00	1	10200.00					

Dynamic Dashboards and AI/ML assisted BI

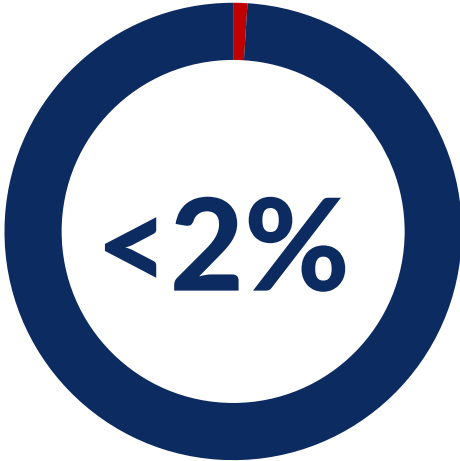


Construction Technology Evolution

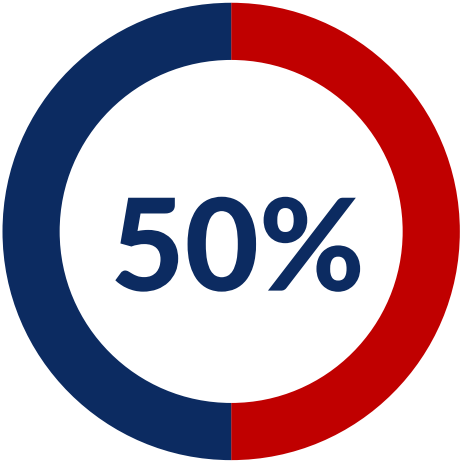


**Adoption is lagging technology evolution.
Technology leadership is not equal to market leadership.**

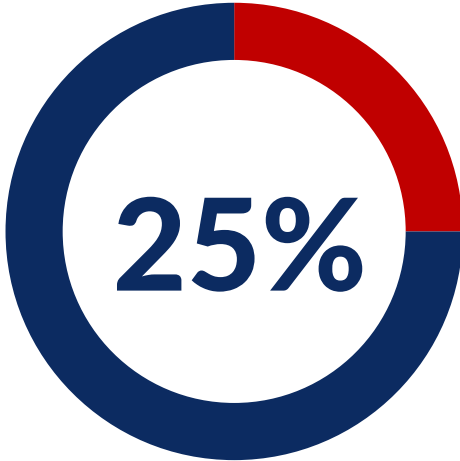
The Construction Industry Has Been Slow to Digitize



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.

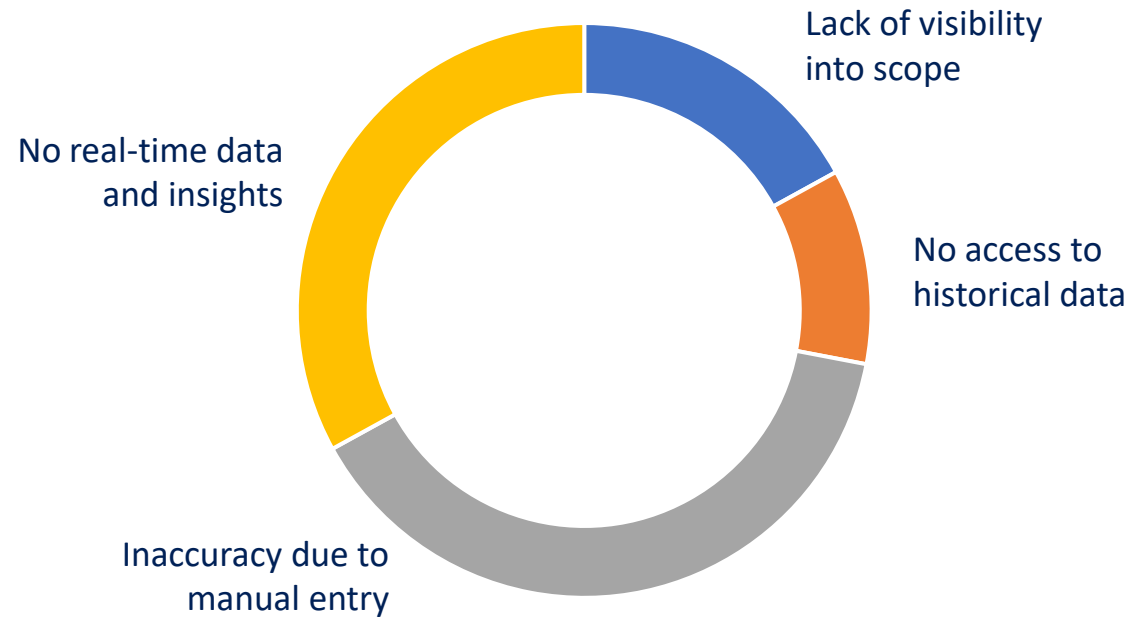


25% of firms have a digital software strategy.

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

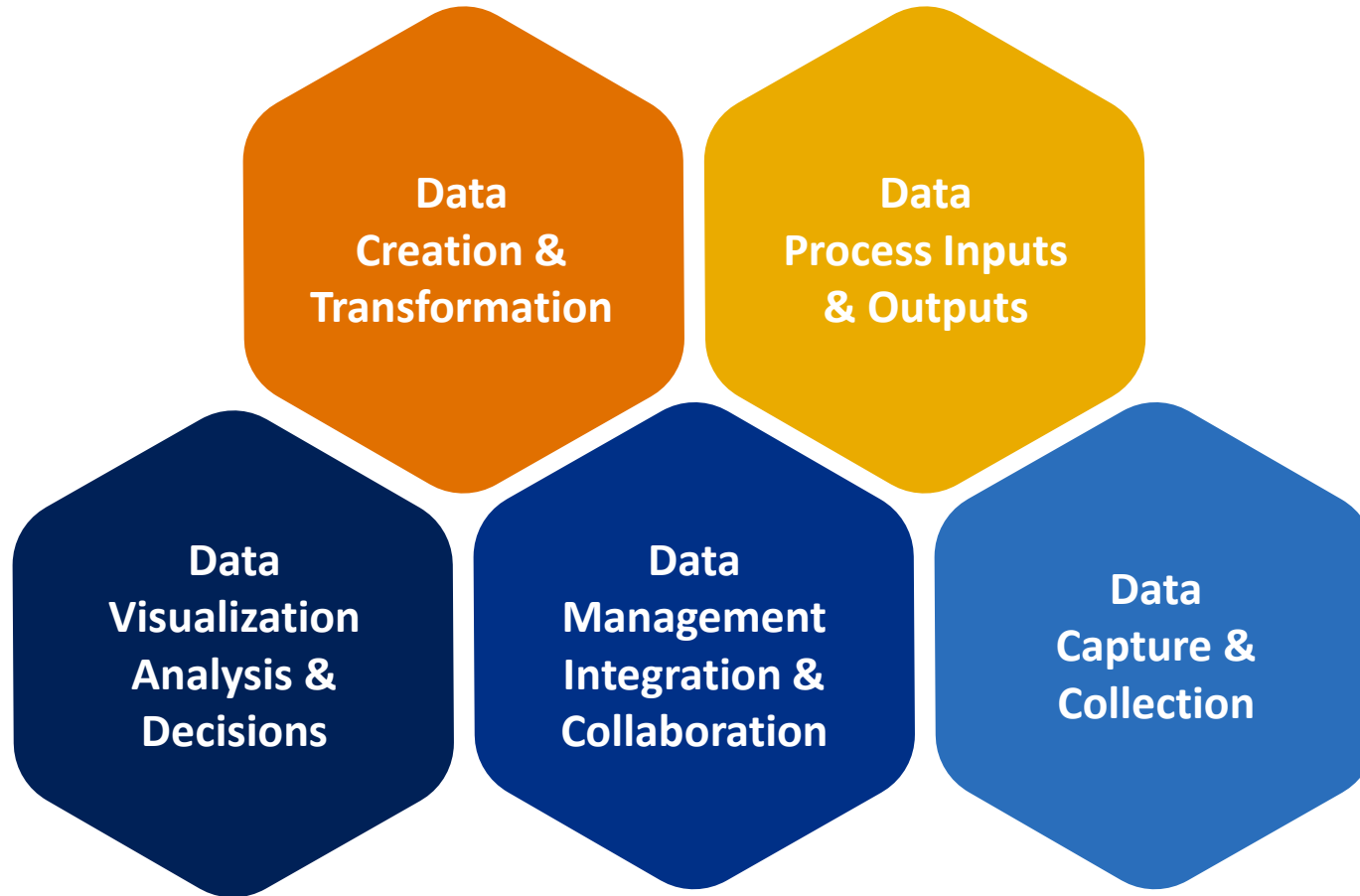
Which of the following challenges have you experienced the most with traditional project controls software?



How Do We Build Trust Going Digital?

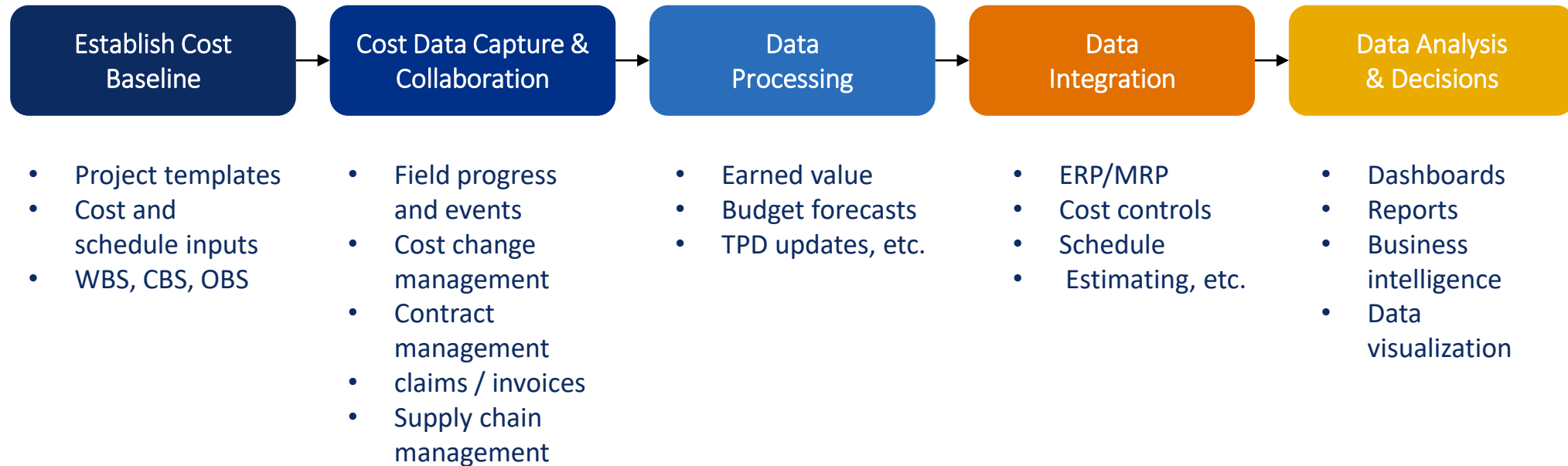


Develop the Building Blocks of Digital Trust



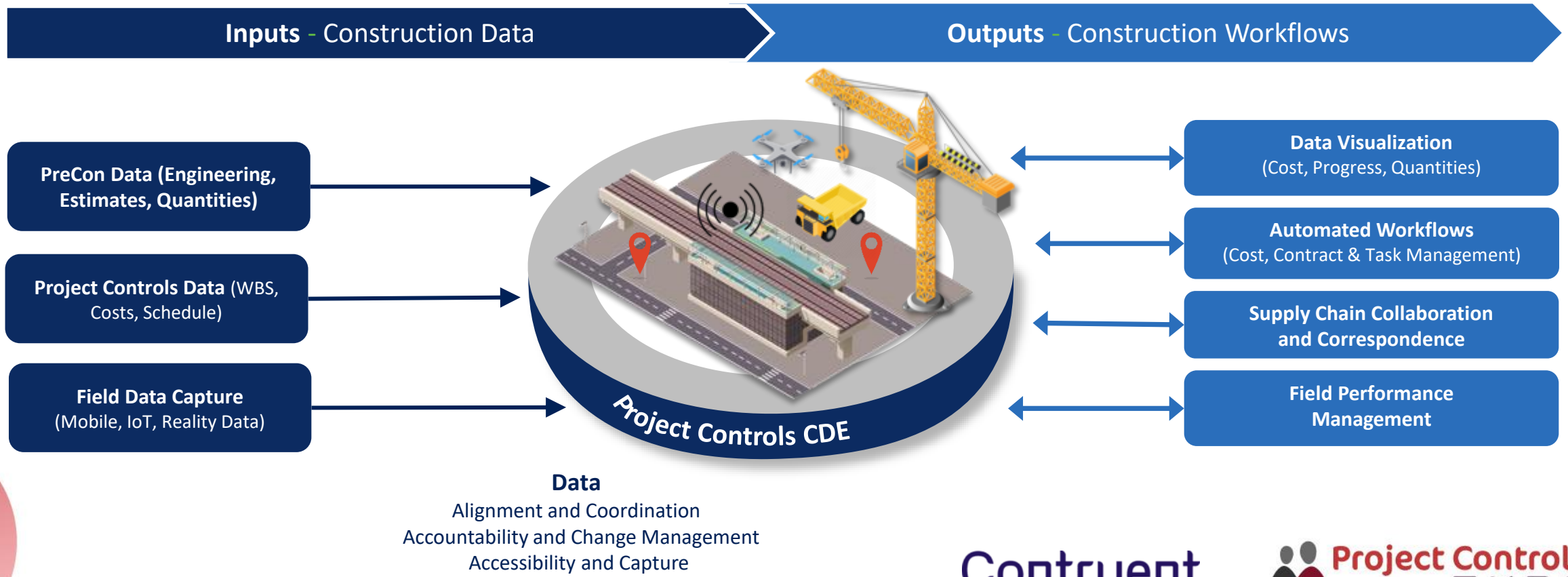
Data Trust and Project Controls Process

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



Data Trust and Project Controls

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

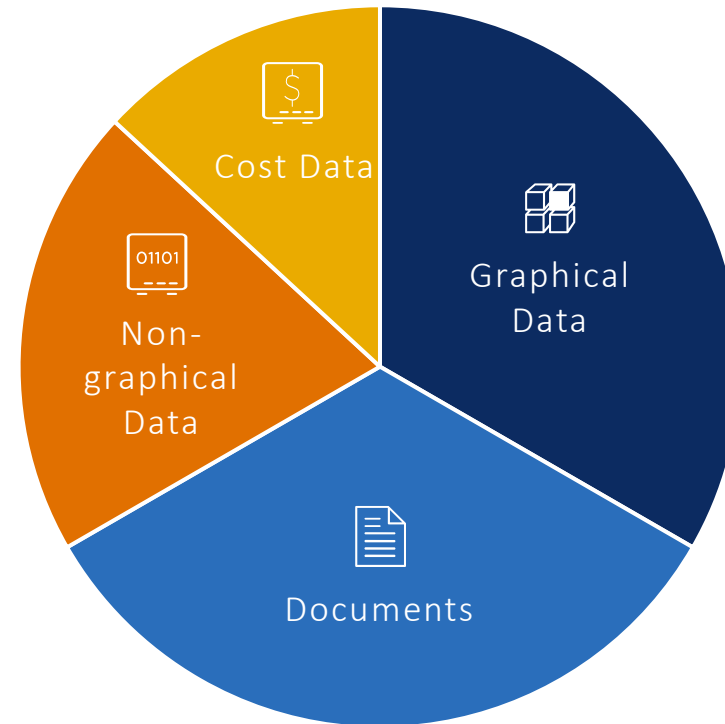


Common Data Environment

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

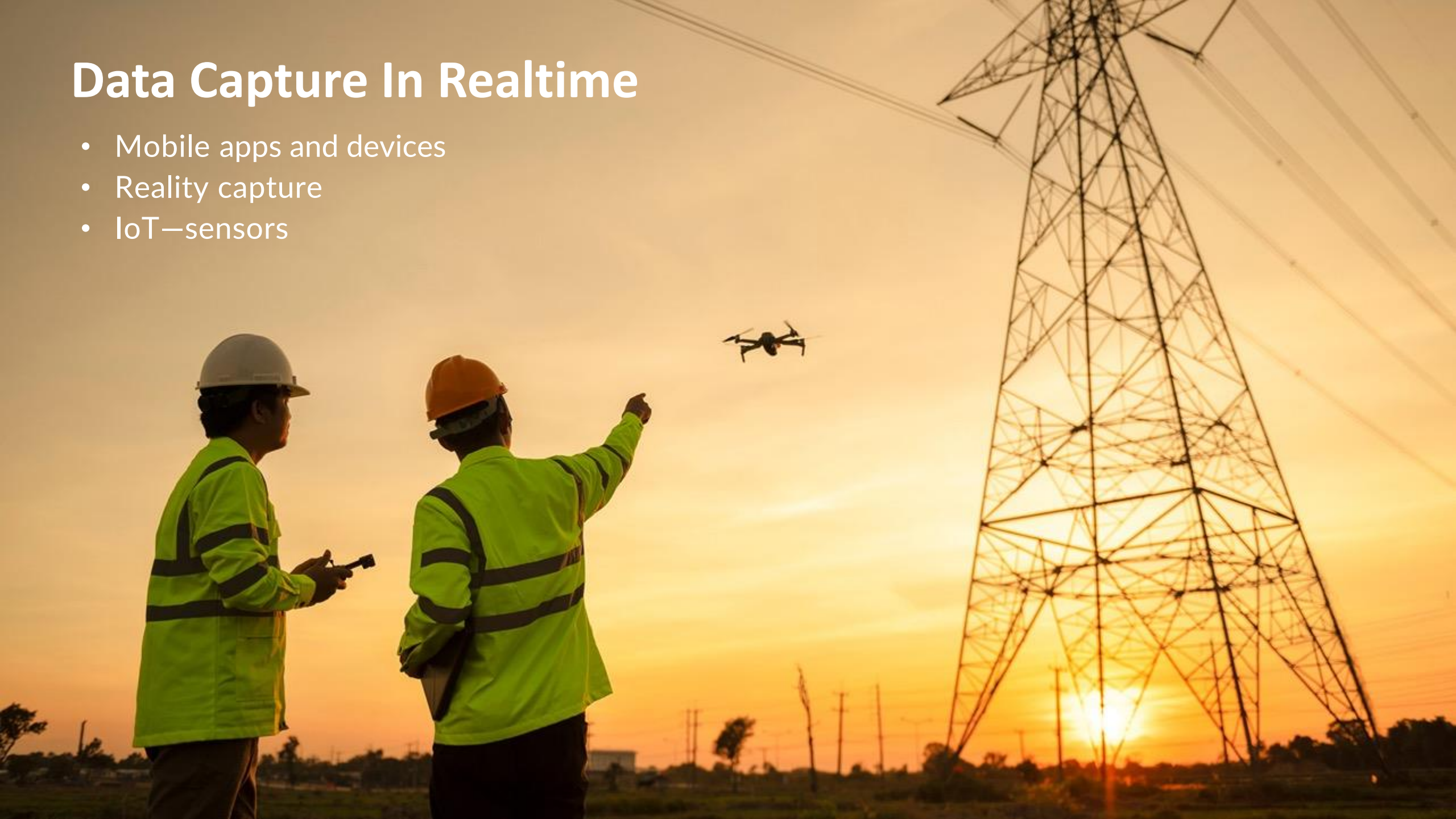


Connected Data Environment



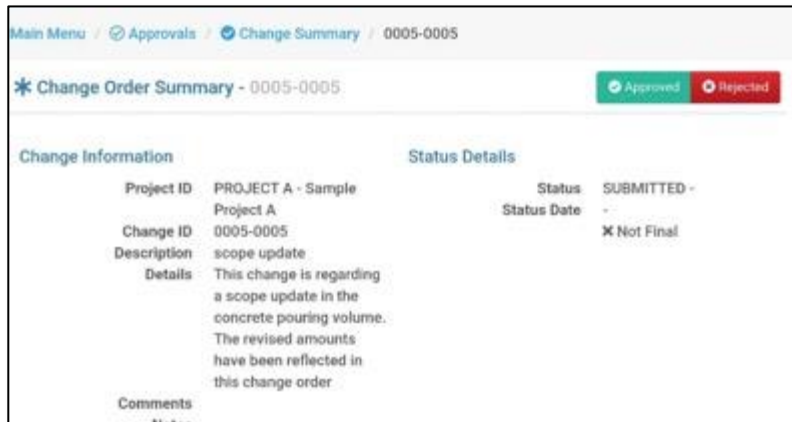
Data Capture In Realtime

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

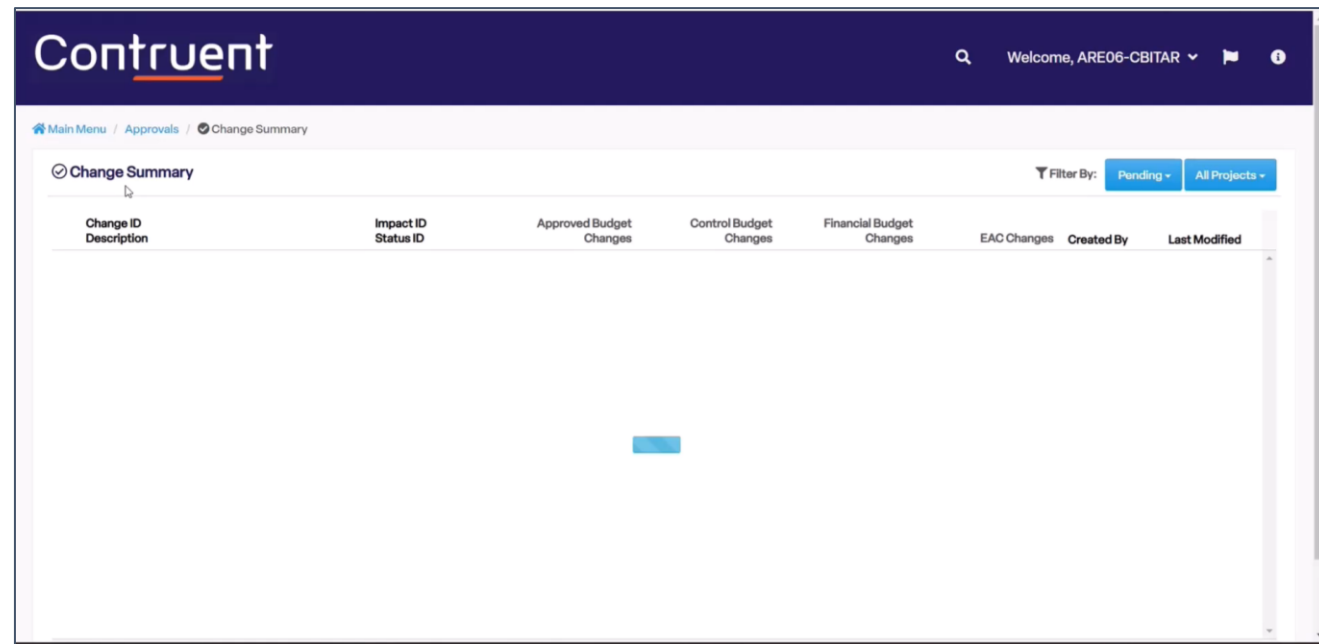


Collaborative Workflows

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



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

Collaborative Workflows

Supply Chain Coordination

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

Contract Information

- Project ID: PROJECT 2
- Project Site: Sample Project 1
- Contract ID: 000
- Description: Sampling Service
- Contractor ID: 000001
- Contractor Name: Smith & Sons Surveying Limited

Previous / Current Progress Claim

Status	Approved Version
Approved	Approved Version
Last Review Date: 01/01/2022	Last Review Date: 01/01/2022
Submitted By: JAMES WATSON	Status
Submission Date: 01/01/2022	Invoice ID
Claimed Hours	
Claimed Cost	

Contract Pay Items

Item	Description	Price	Unit	Quantity	Original Quantity	Approved Change Quantity	Proposed Quantity Installed To Date	Adjusted Quantity Installed To Date	Quantity Installed Previous	Quantity Installed This Period	Original Booked	Approved Hours	Proposed Hours	Adjusted Hours	Hours Worked Previous	Hours Worked This Period	Hours
001	Sampling Work - Public Water Line		DAY	1.00	1.00	1.00					00.00	00.00	00.00	00.00			
002	Sampling Work - Fuel Storage Area	200.00	DAY	1.00	1.00	1.00					00.00	00.00	00.00	00.00			

Contruent Welcome, ARE06-CBITAR

Main Menu / Contractor Portal

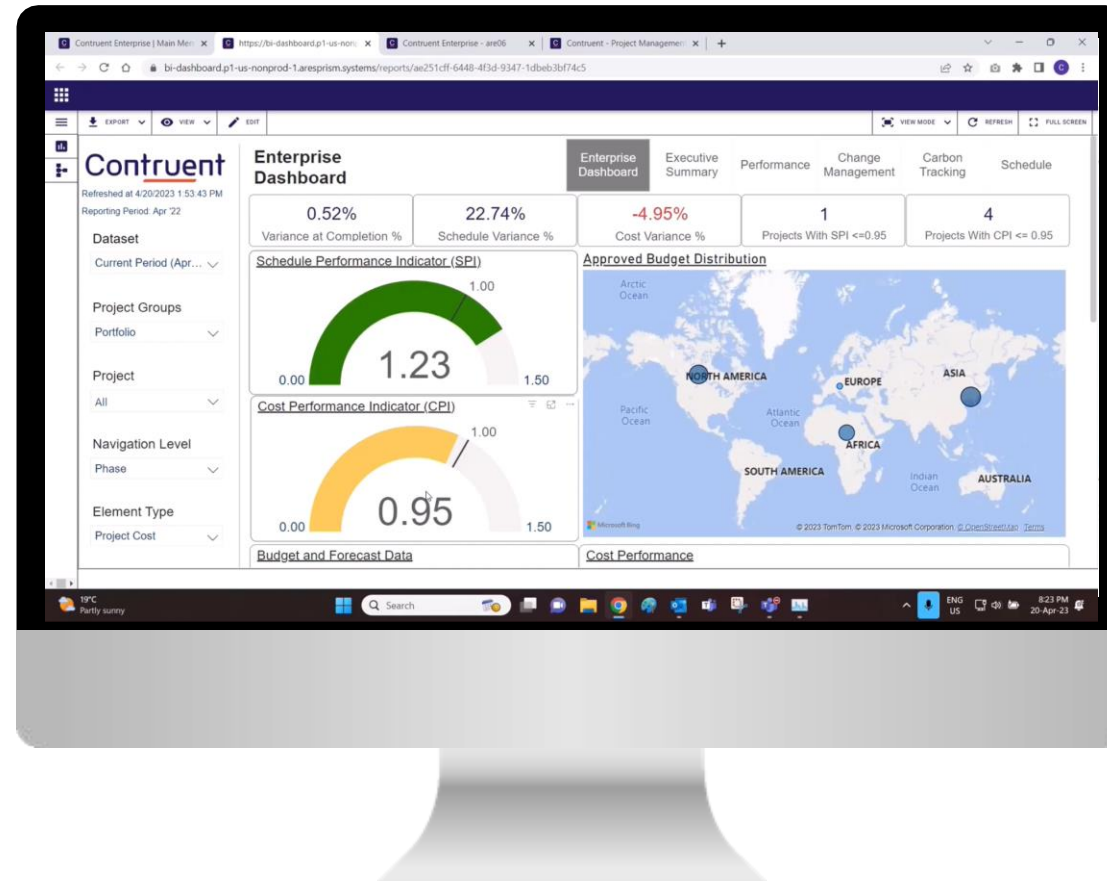
Contractor Portal

- Contract Progress Claims**
View and Submit Contract Progress Claims
- Cost Progress Claims**
View and Submit Cost Progress Claims

Gated contractor access for data viewing, template downloads and uploads

Data Visualization, Analysis & Decisions

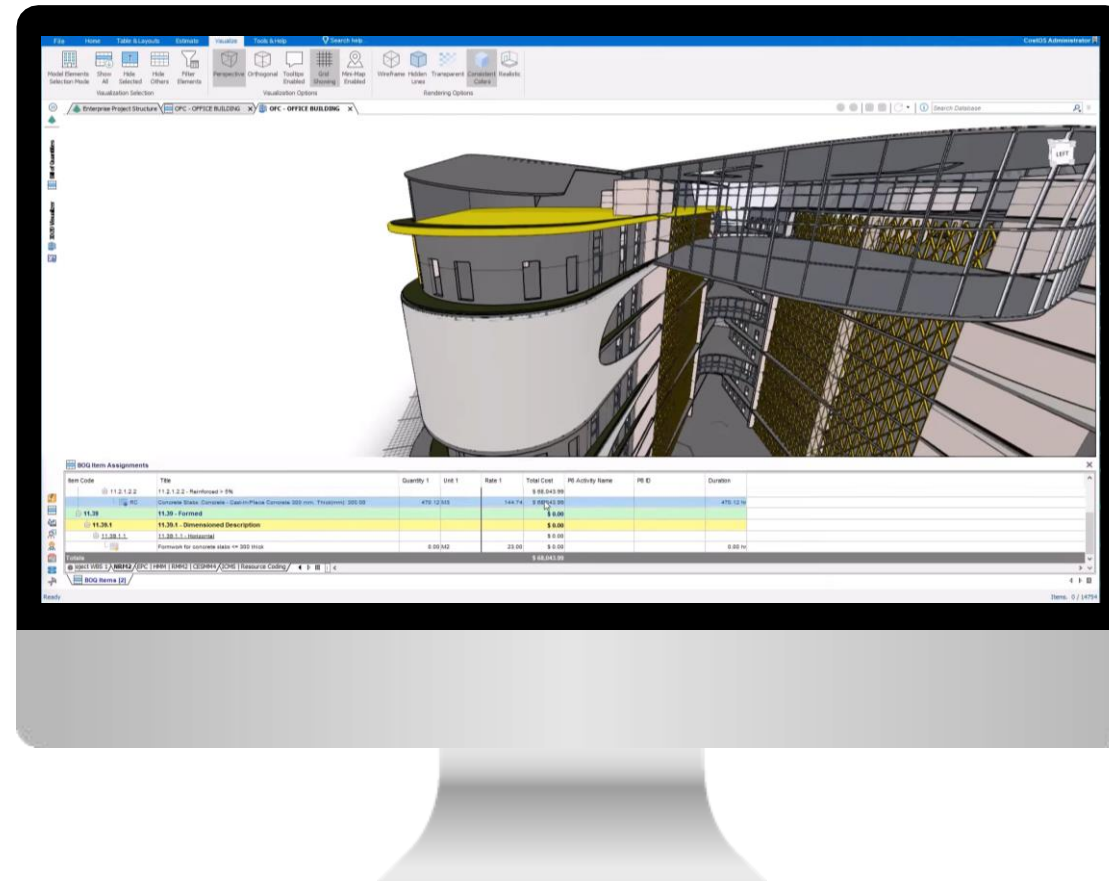
- Dashboarding and reports
- Business analytics/intelligence
- BIM 3D/4D/5D and digital twins
- AR/VR
- AI/ML



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
- Business analytics/ intelligence
- BIM 3D/4D/5D and digital twins
- AR/VR
- AI/ML



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

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.

Contruent Enterprise

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

Contruent Enterprise

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



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

Contruent Enterprise

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
<p data-bbox="331 649 522 756">2%</p> <p data-bbox="242 821 624 992">Reduction of annual spending due to better forecasting and fewer overruns</p> <p data-bbox="293 1013 573 1106">Common Data Environment</p>	<p data-bbox="853 649 1108 756">80%</p> <p data-bbox="751 821 1210 949">Reduction of time spent on data collection, entry and validation</p> <p data-bbox="853 1013 1108 1106">Data Visualization</p>	<p data-bbox="1426 649 1617 756">4%</p> <p data-bbox="1274 821 1783 949">Reduction of contract overspending due to improper change management</p> <p data-bbox="1414 1013 1643 1106">Automated Workflows</p>	<p data-bbox="1987 649 2178 756">1%</p> <p data-bbox="1834 821 2318 949">Reduction of contact spend with better data quality and reliable reporting</p> <p data-bbox="1949 1013 2229 1106">Supply Chain Collaboration</p>

Contruent Enterprise

Comprehensive Cost Controls Solution for Owners/EPCMs



- 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

Deliver Fastest Time-to-Value



- 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

Connect Teams that Own Project/Program Costs and Budget



- 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